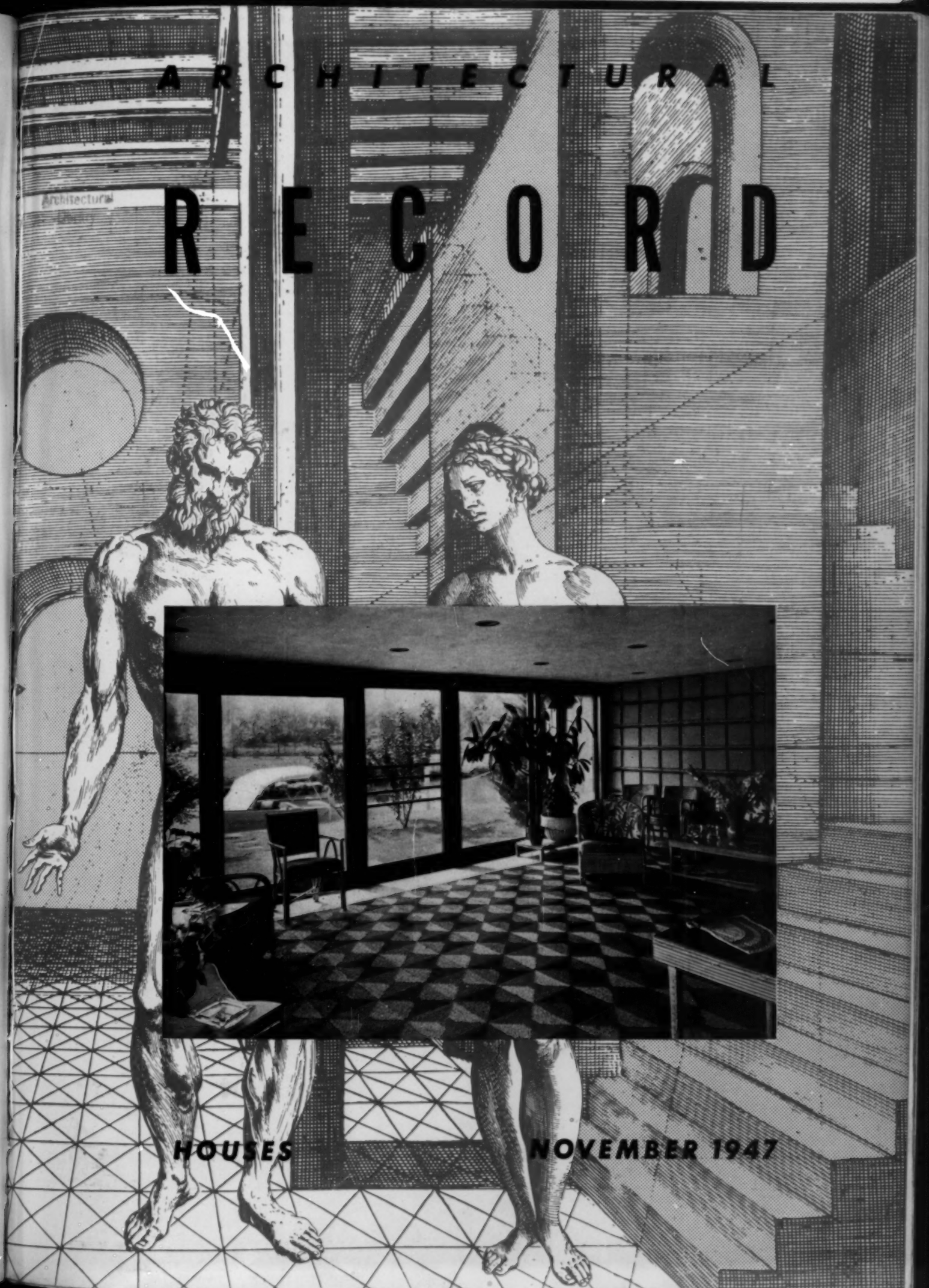
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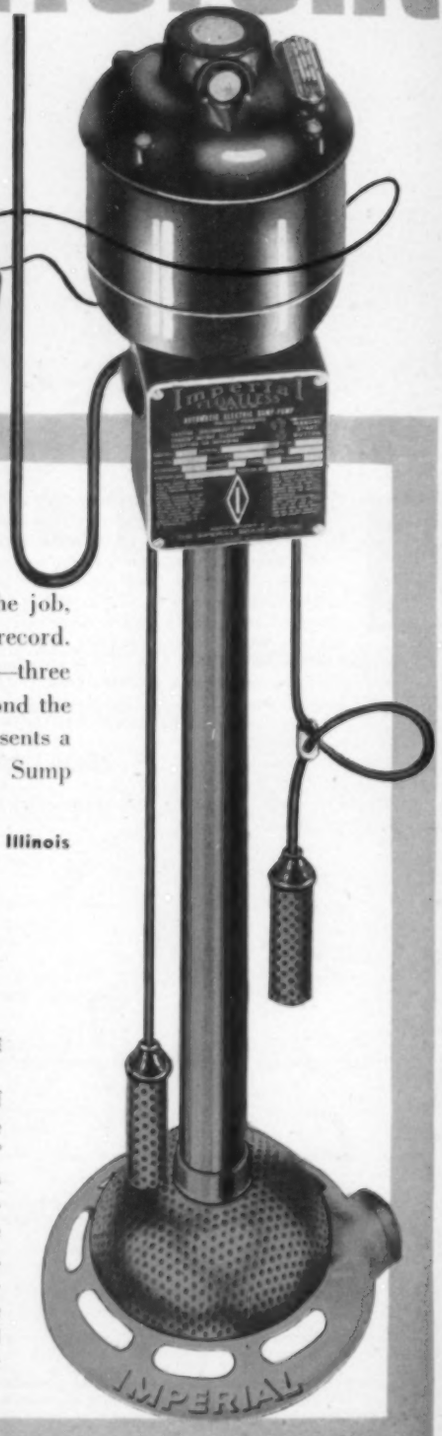

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THE RECORD REPORTS

Scaled-Down Mortgages Urged to Protect Home Buyer Spotlight Moves off Housing • Rent Controls May Be Renewed • Mild Business Recession Predicted for '48

Since Wyatt hurried out of Washington a year ago the Congressmen, federal officials and trade association men interested in housing have been passing back and forth a few ideas, as though hoping that the mere exchange would bring forth something fresh. It was at an early conference of the Joint Congressional Committee on Housing that a new idea did come — offered at the session with architects by Louis Justement, chairman of the Committee on Urban Planning of the A.I.A.

Justement observed that the quantity of housing was disappointing and the quality deplorable. Hardly anyone not forced to do so dared to buy — he too greatly feared that his house would be obsolescent in a few years and his equity lost. Justement agreed that there would, indeed, be high defaults which FHA in part would meet. Instead of its losing by later default, he suggested that the FHA revamp its guarantee so as to insure the home buyer as well as the bank.

Through some stipulated number of years, mortgages on new homes would be scaled down to meet reduced construction costs, which would be officially announced in some federal cost-index. A mortgage on a new house of, say, $10,000 would be reduced by $2000 if the index showed a drop of 20 per cent.

In arguing for it, Justement said that the present system puts the entire risk of a fall in construction costs on the families who don't happen to have bought or rented satisfactorily before the war. The situation creating the risk is not of their making and they alone should not shoulder it.

He argued further that such insurance would eliminate the chief obstacle to home buying; that since defaults are in prospect anyway it would not increase cost to government; that it would improve the quality of homes since builders would have less need to skimp in order to stay within cost limits.

The committee which, like most Congressional groups consists mostly of lawyers, asked how the proposal would work in all sorts of out-of-the-way circumstances that Justement said frankly he had not thought of. Would it apply on resales at a mark-up? How long would the guarantee last? Question-and-answer gradually added precision to what at first was a generality: for instance, that the guarantee would apply only to new starts after a stipulated date and that it would apply only to the original mortgage. Close questioning on marginal points by committee members did not necessarily indicate that they were fighting off the proposal; it is a Congressman's business to look for sharp angles.

Can Strikes Be Avoided?

Max H. Foley of the architectural firm of Voorhees, Walker, Foley and Smith, suggested that the committee ask the building trades union leaders what they can do to avoid jurisdictional strikes. He was sure, on the basis of New York City experience, that the unions would help; he was also quite sure that they would help the committee both to locate and to get rid of union restraints on materials. Suppliers might also be invited to explain their prices in terms of plant and transport costs.

He hoped that the committee would recommend adoption by the industry of the modular system. In the round table conference of Congressmen and architects it was brought out that, although the system standardizes parts, it leaves the architects free to experiment boldly in putting them together.

Standardized Codes Urged

Victor D. Abel, A.I.A., urged that the federal government help standardize code and zone regulations by power of example as well as by precept. Government building on its own land, he pointed out, need not follow local regulation; the separate agencies, in fact, all had their own regulations and built accordingly, ignoring each other as well as the local rules. Standardized government construction would be a great lift to component makers and would influence the whole industry.

The program called for hearings outside Washington from Oct. 20 through Nov. 7: Pittsburgh, Oct. 20; Cleveland, Oct. 21; Detroit, Oct. 22; Indianapolis, Oct. 23; Cincinnati, Oct. 25; Miami, Oct. 27; Jacksonville, Oct. 28; Atlanta, Oct. 29; Birmingham, Oct. 30; New Orleans, Nov. 3–4; Chicago, Nov. 6–7.

Before the committee members left Washington they conceived their job mainly as finding a way to raise output of soil-pipe, nails and gypsum products, finding whether labor practice and local codes are restrictive and whether there are other special circumstances that raise costs.

Spotlight Off Housing

Although the dearth of housing is as much a fact as during Wyatt's stay, less attention is paid it in Washington. Labor Department discovered by a survey that many of the veterans' families have adapted themselves to doubling up or living in furnished rooms and intend to continue that mode of life

(*Continued on page 10*)

"All I asked was a roof over my head and what do I get—outdoor living!"
—Drawn for the RECORD by Alan Dunn

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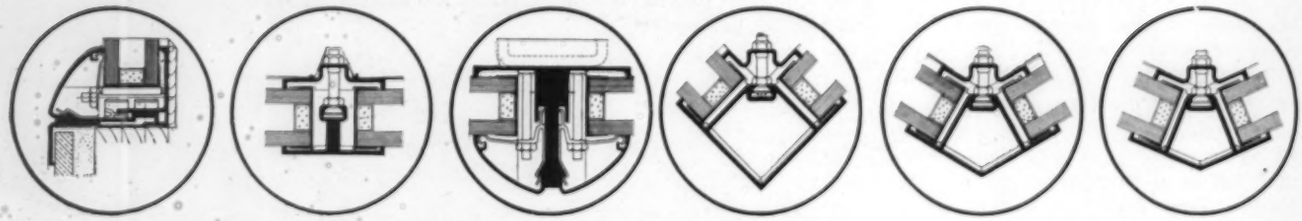

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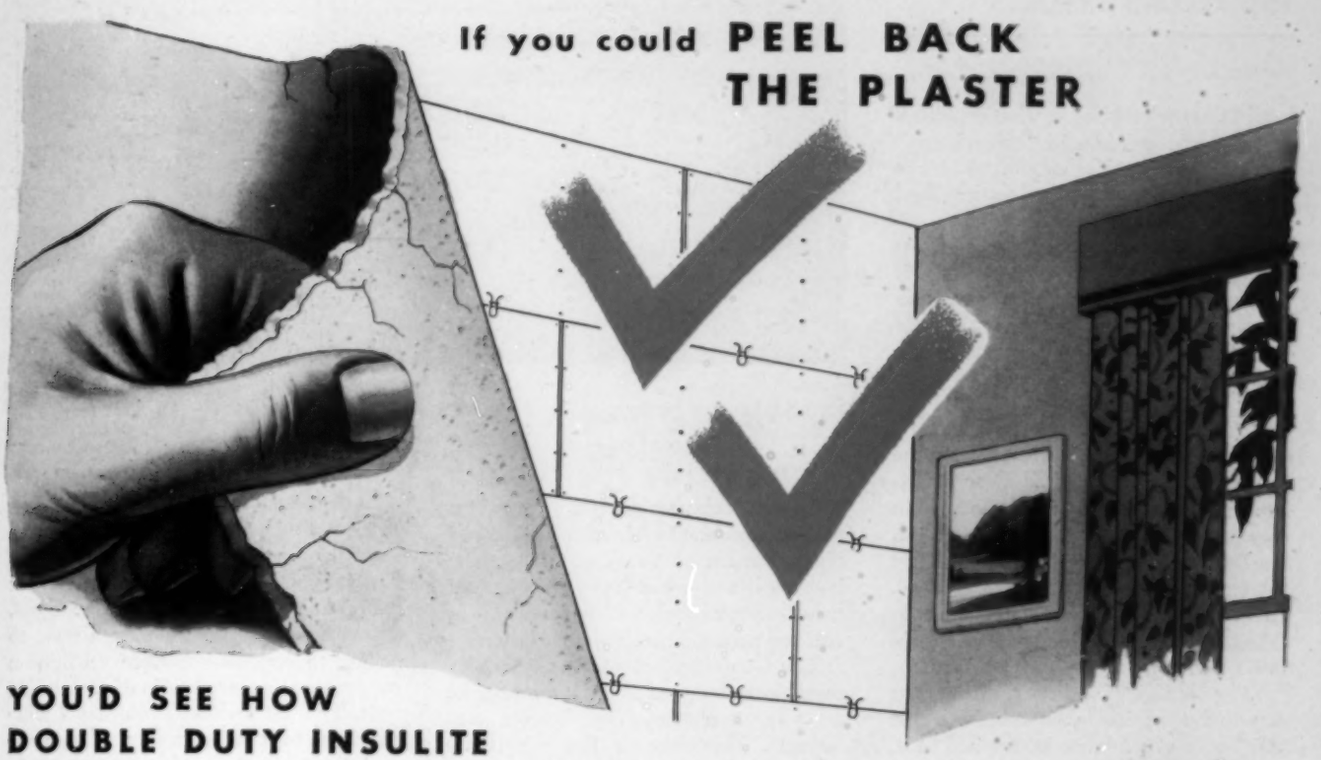

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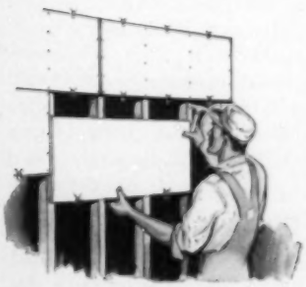

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THE RECORD REPORTS

(*Continued from page 7*)

until prices or rentals are what buildings or landlords would call "ridiculously" low. And so agitation has shifted for the time being to other complaints — food and Russia mostly.

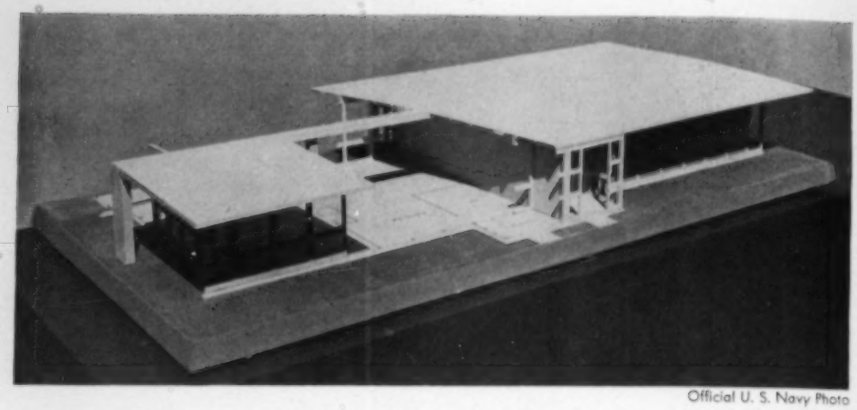
Under the circumstances the prospects for housing legislation during the 1948 session, never bright, are probably dimmer. From time to time violently written press releases for or against the T-E-W Bill recall the issue.

NLRB Sues Carpenters

The NLRB, which through all the Wagner Act years steered clear of on-site construction, is suing to enjoin carpenters from violating the Taft-Hartley Act; this may be a step toward taking jurisdiction. Counsel Robert N. Denham, who decides which cases to take, has not yet decided whether to go in deeper. Here is the way he put it:

"The building industry, from the standpoint of its labor relations, the manner in which labor is supplied to it, and the manner in which the industry itself is carried on, is perhaps the most

(*Continued on page 16*)



Official U. S. Navy Photo

Earthquake- and typhoon-resistent precast concrete bungalow Navy-designed for Guam

BUNGALOWS FOR GUAM

Precast concrete homes of modern design, specifically developed by the Navy Bureau of Yards and Docks for housing island-based Navy families, are being constructed for dependents of enlisted personnel stationed at Guam.

The Guam project consists of duplex bungalows designed to resist earthquake tremors, typhoons, fire, insects and rodents. Materials for the houses are shipped in bulk, and the wall and roof panels are molded, finished, surface treated and cured where they are cast — at or near the building site.

Each bungalow contains a living room, dining room, two bedrooms, front and service porches, kitchen and bath. Interior partitions are of ¾-in. plywood; floors are concrete. Instead of windows, screened jalousies extend from floor to ceiling to provide complete ventilation on the three exposed sides of each living unit. The flat insulated roof has a wide overhang to provide protection from sun and tropical rains. Kitchens and baths are completely modern, and all services are electric.

Department of State Photo

Residential buildings by U. S. architects: part of exhibit at Pan American Congress

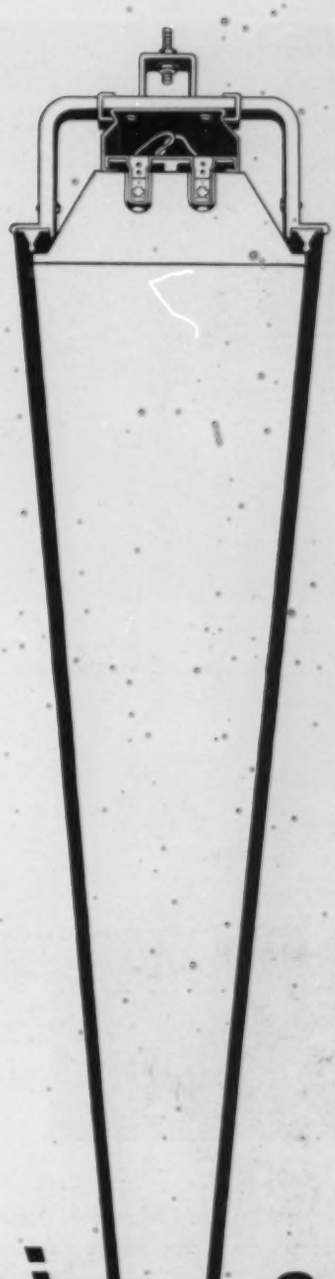
U.S. ARCHITECTS' WORK SHOWN IN PERU

Work of 97 United States architects and planners was represented in the exhibition of Architecture and City Planning, 1937–1947, at the Sixth Pan American Congress of Architects at Lima, Peru, last month. Also exhibited at the conference were a display of current work in 11 U.S. architectural schools and a showing of over a hundred books on architecture, planning and construction.

Consisting of 42 large panels of photographs and plans, the architecture exhibit included buildings of all types: residential; recreational; offices; broadcasting stations; industrial facilities; transportation structures; stores and shopping centers; theaters; public buildings; libraries; museums; churches; schools and colleges; hospitals. The planning section showed examples of neighborhood units, planned urban and rural communities, housing units, and urban redevelopments.

The material for the exhibit was selected by the American Institute of Architects and the American Institute of Planners. Among architects and designers whose work was represented were: Harwell Hamilton Harris, Walter F. Bogner, Paul Thiry, Royal Barry Wills, Carl Koch, Victorine and Samuel Homsey, Frank Lloyd Wright, Richard J. Neutra, Mayer & Whittlesey, Garner A. Dailey, Alden B. Dow; Skidmore, Owings & Merrill; George Howe; Franklin, Kump & Associates; William Lescaze; Kahn & Jacobs; Albert Kahn, Associate Architects & Engineers, Inc.; Austin Co., Engineers & Builders; William Wilson Wurster; Perkins & Will; Holabird & Root; Morris Ketchum, Jr.; Reinhard & Hofmeister; Philip L. Goodwin and Edwin D. Stone; Vernon DeMars.

The United States delegation to the Pan American Congress was headed by Julian Clarence Levi, chairman of A.I.A. Committee on International Relations. Delegates were Marshall A. Shaffer, chief, Office of Technical Services, Division of Hospital Facilities, U.S. Public Health Service; Ralph Walker, A.I.A., New York; Samuel I. Cooper, A.I.A., Atlanta; Lewis P. Hobart, A.I.A., San Francisco.



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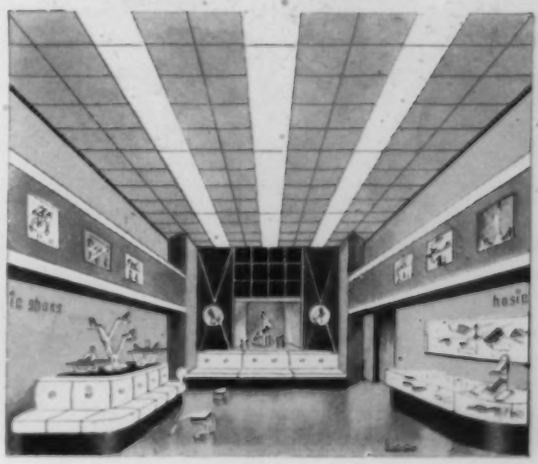

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BONWIT TELLER TAKES OVER OLD MUSEUM

Imagination and whimsy keynote the new Boston branch of Bonwit Teller, New York emporium of the *haut monde*. Incredibly occupying the dignified premises of the New England Museum of Natural History, the store has been made by designer William Pahlmann a daring antithesis of current merchandising principles, a tongue-in-the-cheek admixture of Victorian and modern.

Large-patterned chintz, vivid colors, antique furniture, crystal chandeliers, *objects d'art*, and an almost total lack of merchandise on display give the store a country-house air which is as effective as it is startling in these days of austere functionalism in store design. The thoroughly modern stock and fitting rooms and wall cases are discreetly hidden from view.

Color is used lavishly throughout, splashed against a soft grey background. Much of the furniture is antique, with gilt frames and bright upholstery.

Coats, suits, dresses and furs are sold in 40- by 80-ft. main section of second floor. Carpet is two shades of grey, drapes red

Millinery salon, third floor, boasts a vivid red and green carpet, Kelly green walls, gilt chairs, elaborate lighting, rococo mirrors

Hans van Nes Photos

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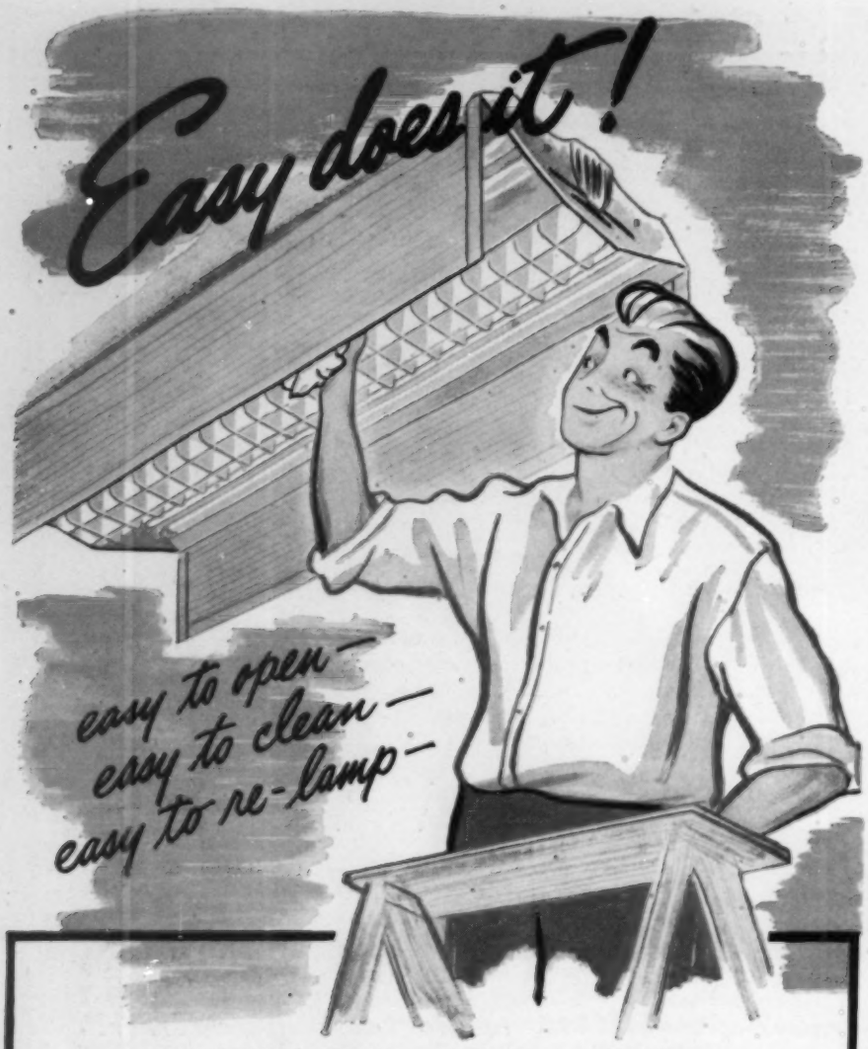

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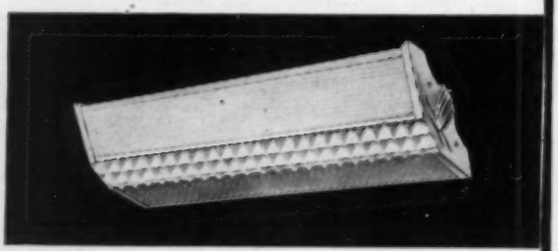

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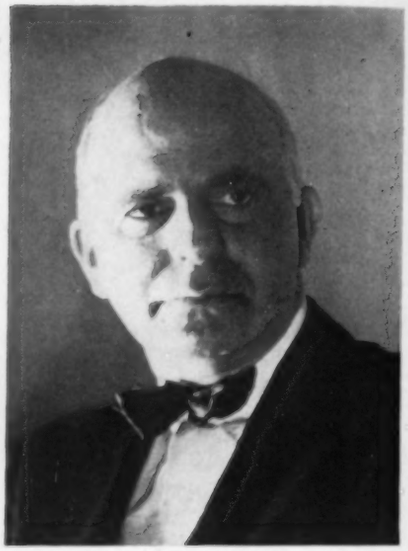
JAMES G. ROGERS

James Gamble Rogers, 80, architect of the Yale University Memorial Quadrangle, the new Columbia University Library, the Columbia-Presbyterian Medical Center and many other widely known buildings, died in New York on October 1st following a short illness.

A Fellow of the American Institute of Architects, Mr. Rogers was a graduate of Yale University and the Ecole des Beaux Arts in Paris. Best known for his college work, he designed buildings for New York University, Sophie Newcomb College, Northwestern University, and a number of others.



HOWARD MYERS

In the death of Howard Myers, for 23 years publisher and editor of *The Architectural Forum*, the architectural world has lost a staunch and valued friend. Mr. Myers succumbed to a heart ailment on September 18th, at the age of 52.

Mr. Myers devoted his entire business career to the building field. He was manager of the housing department of the National Lead Company from 1915 to 1919. Joining the *Forum* in 1919 as vice president, he was made publisher six years later — a post which he filled with rare insight and understanding until his death.

Always keenly interested in housing problems, Mr. Myers served as chairman of the architectural advisory committee of the Federal Public Housing Authority, and as a director of the National Public Housing Conference and the New York Citizens Housing Council. He also was a governor of the New York Building Congress, a member of the American Design Award Jury, a director of the Beaux-Arts Institute of Design, and a member of the Architectural League.

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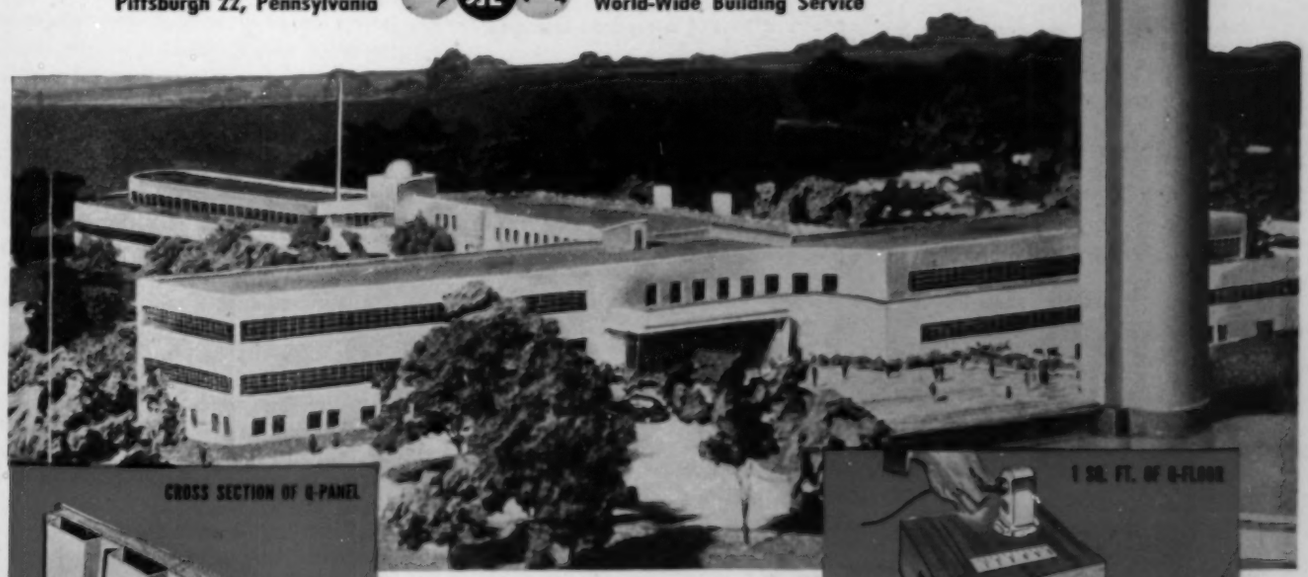

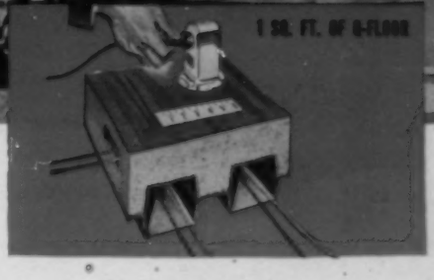

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Nutley, New Jersey
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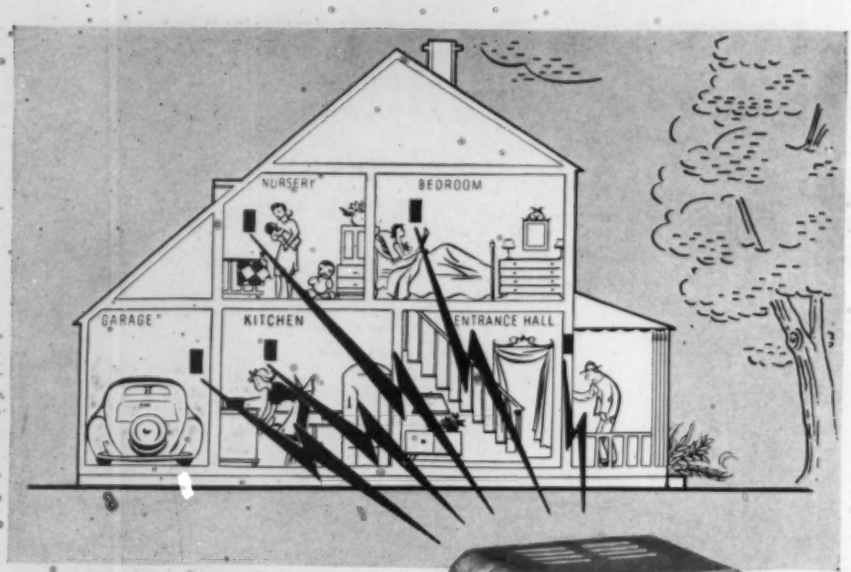
Architects and Engineers



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THE RECORD REPORTS

(*Continued from page 10*)

complicated in our structure. . . . There are points in it where jurisdiction by the Board under this section . . . will be quite obvious, but where there is one such instance, there will be many where, from both legal and practical grounds, the exercise of jurisdiction will be highly questionable. I do not believe anyone in the industry, either on the side of labor or the employer, or within the official structure of the Board, has yet been able to arrive at a clear conclusion as to how this problem can be successfully handled. Obviously, we are hopeful that the building trades and the builders will be able jointly to develop some program for the adjustment of jurisdictional disputes within their area of operations without resort to the Board, and we are not without considerable encouragement that this is a possibility. On the other hand, in some of the disputes we can do no more than take them as we get them and proceed in strict conformity with the law and the regulations as they have been laid out."

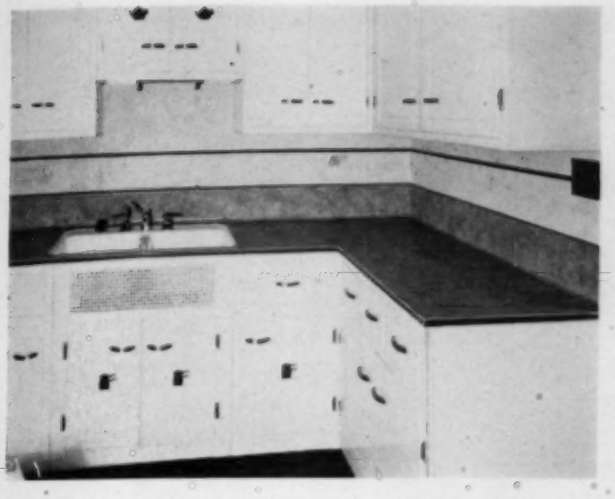
This means a little more than Denham's simply not knowing what he'll do. He took one case and victory clearly would invite fresh complaints. He realizes that. But he is trying to mark out an area from which to exclude himself: hence, hint of a broad settlement by the Board. Since the industry stayed away all these years, such a settlement seems plausible enough insofar as jurisdictional strikes are concerned; whether it would also cover boycotts of components is something else. While builders and unions might be willing, outside manufacturers might not.

Rent Controls Again?

In Washington it was expected that, while other legislation was doubtful, renewal of rent controls was highly likely. The President is expected to ask for it in the Statement to the Nation in January; this is important even though an opposition party controls Congress. The wave of utter distaste for all controls of every sort seems to have reached its crest, so that opposition to renewal may be relatively mild.

Justice Department's new cases within the building and real estate industries are, of course, of little practical importance. They won't be adjudicated for years. While Justice goes to court with the "realtors," it and other agencies also deal with them as in the past; War Assets Administration gets their advice on real estate sales. More immediately, the Department is preparing to argue before the Supreme Court on a suit in-

(*Continued on page 138*)



Sink tops covered with linoleum present a smooth, unbroken area without dirt-catching joints or seams. Coving the linoleum to the wall eliminates dirt-catching corners. The ease with which this material can be cleaned is another of its sanitary features.

Restaurant tables as well as display counters, shelves, and cabinets for stores can be covered with linoleum for a durable and attractive finish. Wood or metal edgings are often used to protect the edges and add to the appearance of such installations.

edges and seams should be sealed with a waterproof cement to prevent water from getting between the linoleum and the base. Seepage of water under the linoleum will destroy the adhesive as well as the backing and binders of the linoleum. As a protection to exposed edges, various types of wood or metal edgings can be used. The underlayment of asphalt saturated felt on a sink top installation compensates for the thickness of the edging flange. It also prevents the linoleum from becoming damaged by the expansion and contraction of wood construction.

RESILIENT TILE

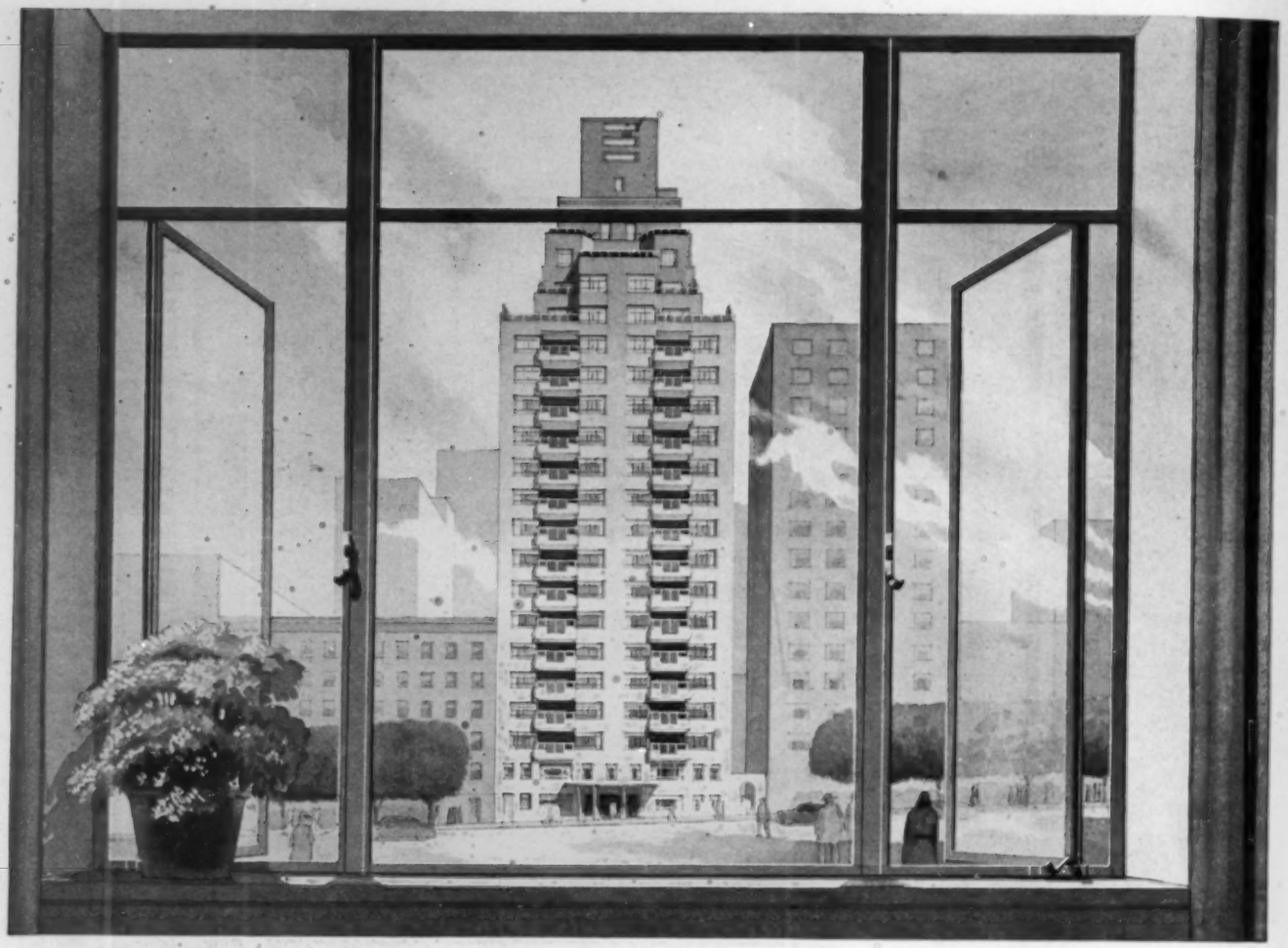
The various types of resilient tile flooring materials have been used to some degree for counter top coverings. These materials, asphalt tile, Linotile®, rubber tile, and cork tile, are limited in their application, however, because installation involves numerous joints between the tile. They are not practical for sink tops because the joints permit the possibility of water getting under the tile. And, with the exception of asphalt tile, it is difficult to apply the tile materials to rounded surfaces and corners. The thermoplastic quality of asphalt tile makes it practical to heat and bend this material to conform to rounded surfaces and corners of counters and cabinets. By pre-heating asphalt tile also can be flashed from horizontal to vertical surfaces to eliminate dust-catching corners.

When asphalt tile is installed on counter tops and other horizontal surfaces, an asphalt emulsion can be used as the adhesive. On vertical surfaces, such as counter fronts, a heavy-bodied cement of the type used for the installation of hardboards or acoustical materials should be used. This adhesive takes a positive set and hardens quickly. It offsets the possibility of the tile's settling or slipping down as it might if slow-setting asphalt adhesives were used. Rubber tile, Linotile, and cork tile can be installed satisfactorily to counter tops with linoleum paste.

New architectural uses for resilient flooring materials are under constant study in Armstrong's Research Laboratories. Architects desiring assistance in unusual installations of resilient flooring materials are invited to contact any Armstrong office for unbiased recommendations or write, stating specific problems to Armstrong Cork Co., Floor Div., 2411 State Street, Lancaster, Pa.

Facing for counters and cabinets is another use to which resilient flooring materials can be put. Whether linoleum or resilient tile materials are used for this purpose, decorative insets can be installed in the covering. Scuffing has little effect on these finishes.

Asphalt tile, although limited in its practical application to surfaces where numerous joints are not objectionable, has advantages in its thermoplastic qualities. It can be heated and bent to form a dirt-free cove at the junction of vertical and horizontal surfaces.



Apartment House, 120 E. 79th St., New York. Architect: Sylvan Bien, New York. Contractors: S. Minskoff & Sons, New York. Adapted from the original rendering by J. Floyd Yewell.

Modern design in apartment house planning demands the functional beauty of Lupton Metal Windows. Narrow frames and mullions assure maximum daylight, lending a feeling of spaciousness and luxury to each dwelling unit. Lupton Metal Windows offer controlled, draft-free ventilation. Outswinging ventilators catch and gently deflect air currents into the room. Extended hinges permit cleaning all glass from the inside. Metal frame screens for Lupton Metal Casements are easily attached on the inside of the window. There is a Lupton Metal Window for every type of building. Write for our new 1947 Catalog or see it in Sweet's.

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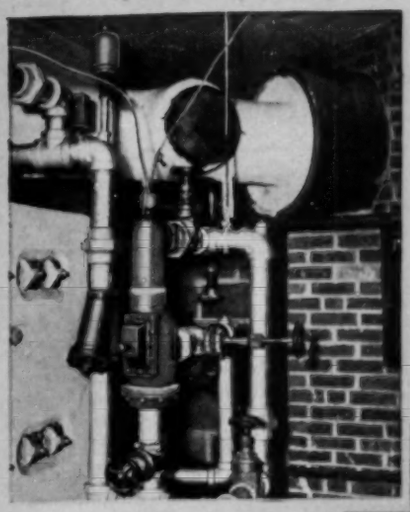
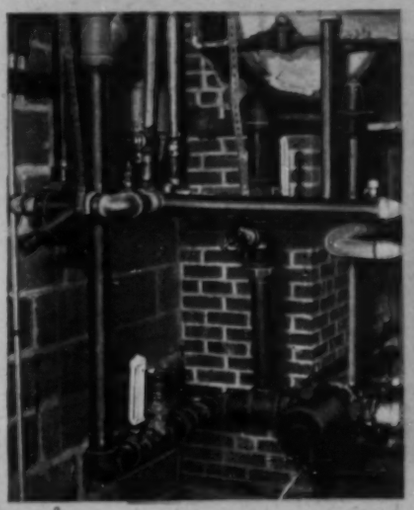


SCHOOL

Installation of the Packaged Unit consisting of the Sarcotherm Valve and the accessories shown below.



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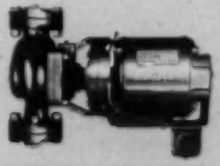


CIRCULATING PUMP

FLOW VALVE

STRAINER

9

CONSTRUCTION COST INDEXES — Labor and Materials

United States average 1926—1929 = 100

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corporation, from data compiled by E. H. Boeckh & Associates, Inc.

NEW YORK

Period	Residential Brick	Residential Frame	Apts., Hotels, Office Bldgs. Brick and Concr.	Commercial and Factory Buildings Brick and Concr.	Commercial and Factory Buildings Brick and Steel
1920	136.1	136.9	123.3	123.6	122.6
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1941	134.5	135.1	135.1	137.2	134.5
1942	139.1	140.7	137.9	139.3	137.1
1943	142.5	144.5	140.2	141.7	139.0
1944	153.1	154.3	149.6	152.6	149.6
1945	160.5	161.7	156.3	158.0	155.4
1946	181.8	182.4	177.2	179.0	174.8
May 1947	219.1	221.6	205.6	206.8	203.4
June 1947	219.3	221.8	205.9	207.0	203.6
July 1947	223.4	225.0	211.2	212.5	206.6
Aug. 1947	225.5	227.1	215.5	214.9	209.4
	% increase over 1939				
Aug. 1947	**82.6**	**85.5**	**64.6**	**61.1**	**60.9**

ATLANTA

Period	Residential Brick	Residential Frame	Apts., Hotels, Office Bldgs. Brick and Concr.	Commercial and Factory Buildings Brick and Concr.	Commercial and Factory Buildings Brick and Steel
1920	122.8	122.9	108.6	109.8	105.7
1925	86.4	85.0	88.6	92.5	83.4
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1941	97.5	96.1	99.9	101.4	100.8
1942	102.8	102.5	104.4	104.9	105.1
1943	109.2	109.8	108.5	108.1	108.7
1944	123.2	124.5	117.3	117.2	118.2
1945	132.1	133.9	123.2	122.8	123.3
1946	148.1	149.2	136.8	136.4	135.1
May 1947	180.2	183.9	155.1	154.1	154.2
June 1947	180.4	184.1	155.4	154.3	154.4
July 1947	184.0	187.9	160.3	159.6	158.8
Aug. 1947	185.4	189.3	162.4	161.2	161.4
	% increase over 1939				
Aug. 1947	**114.8**	**128.0**	**70.7**	**65.5**	**70.4**

ST. LOUIS

Period	Residential Brick	Residential Frame	Apts., Hotels, Office Bldgs. Brick and Concr.	Commercial and Factory Buildings Brick and Concr.	Commercial and Factory Buildings Brick and Steel
1920	118.1	121.1	112.1	110.7	113.1
1925	118.6	118.4	116.3	118.1	114.4
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1941	118.8	118.0	121.2	121.7	122.2
1942	124.5	123.3	126.9	128.6	126.9
1943	128.2	126.4	131.2	133.3	130.3
1944	138.4	138.4	135.7	136.7	136.6
1945	152.8	152.3	146.2	148.5	145.6
1946	167.1	167.4	159.1	161.1	158.1
May 1947	199.3	200.5	178.3	179.2	177.1
June 1947	202.2	202.2	182.8	185.4	182.1
July 1947	205.6	207.2	187.8	187.8	187.5
Aug. 1947	207.0	208.6	189.9	189.4	190.1
	% increase over 1939				
Aug. 1947	**87.7**	**94.9**	**60.0**	**58.1**	**59.7**

SAN FRANCISCO

Period	Residential Brick	Residential Frame	Apts., Hotels, Office Bldgs. Brick and Concr.	Commercial and Factory Buildings Brick and Concr.	Commercial and Factory Buildings Brick and Steel
1920	108.8	107.5	115.2	115.1	122.1
1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1941	116.3	112.9	120.5	123.4	124.3
1942	123.6	120.1	127.5	129.3	130.8
1943	131.3	127.7	133.2	136.6	136.3
1944	139.4	137.1	139.4	142.0	142.4
1945	146.2	144.3	144.5	146.8	147.9
1946	159.7	157.5	157.9	159.3	160.0
May 1947	188.8	187.2	178.1	180.6	180.9
June 1947	189.0	187.4	178.4	180.8	181.1
July 1947	195.1	194.0	186.6	190.6	188.0
Aug. 1947	196.7	195.6	188.9	192.4	190.8
	% increase over 1939				
Aug. 1947	**86.4**	**97.0**	**60.8**	**57.8**	**63.7**

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

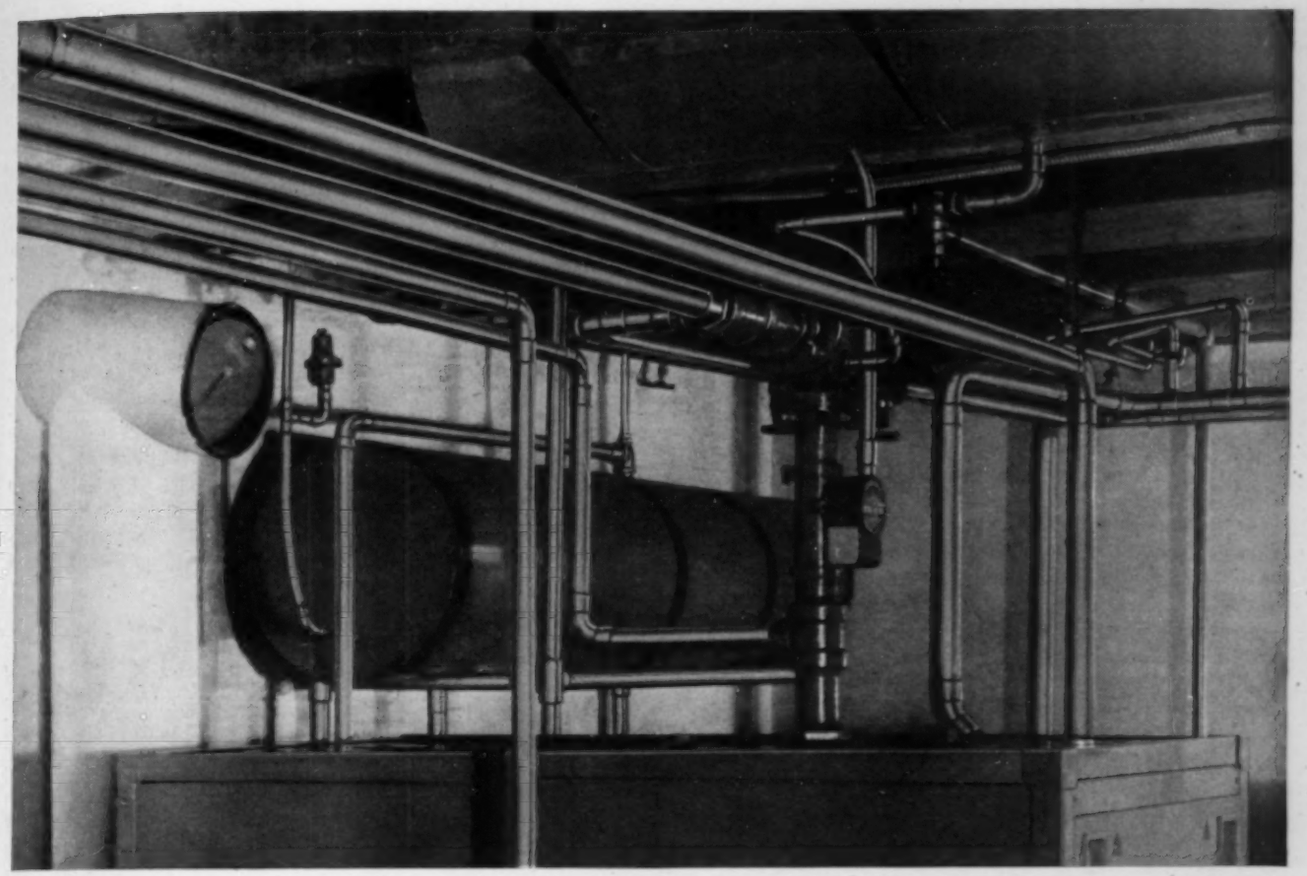
Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.



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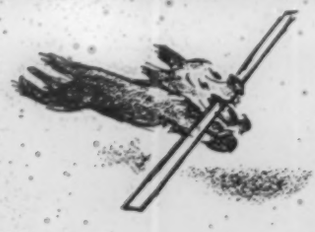


REQUIRED READING

WHO DUNN IT?

The Last Lath. A book of cartoons by Alan Dunn, reprinted from the ARCHITECTURAL RECORD. *New York 18 (119 W. 40th St.), F. W. Dodge Corp., 1947. 8 by 10 in. 96 pp. $2.50.*

Reviewed by T. H. ROBSJOHN-GIBBINGS

Do you suffer from architecture? Is your environment uncontrolled? How is your relationship to the technology in which you live? Is your organic synthesis sluggish? Are your lines of flow obstructed? Do you have trouble with your mechanical core? If so, try Alan Dunn and THE LAST LATH, available at your nearest bookstore — and laugh yourself silly.

Alan Dunn — unlike far too many architects — sees architecture steadily and sees it whole. For the last 10 years, like an omnipresent Puck, he has been peering around the sacred corners of pomposity and slipping unobserved into the inner sanctums of dogma. Unnoticed he has been eavesdropping behind the architectural scene, not missing a word or a line, particularly when they were not intended for public consumption. With sly glee he has listened to the babel of pseudo-scientific verbiage being added to the classic architectural vocabulary; and with sardonic detachment he has watched the layman groping his way through its labyrinthine obscurities. Wherever and whenever the world of architecture finds itself momentarily confounded with the impact of human fallibility and dogmatic pretense, there is Alan Dunn at the exact moment of concussion.

For too long now all this quick persiflage has been limited to the readers of the ARCHITECTURAL RECORD, and it is first-rate news to find the Dunn drawings concentrated with all the potentialities of nuclear fission in THE LAST LATH. It is good news because, knowingly or unknowingly, architecture — particularly modern architecture — was badly in need of the salutary ingredient found here. Urgently needed was the equivalent of a Pope who could strike down the architectural pretentiousness of a landed gentry with the remark that "if they starve they starve by rules of art"; or an Osbert Lancaster to tell us that a machine for living "presupposes a barrenness of spirit to which . . . we have not yet quite attained."

For, to tell the truth, something of a Teutonic dourness, something authoritarian and un-American, has been settling like a grim miasma over the professors and students of a supposedly American architecture. Look as we may, we find it difficult to discover among the youth of U. S. building the individual and the optimistic equivalent of a Frank Lloyd Wright. Can it be that the siren voice of the International Stylist who said, "The individual is losing significance. His destiny is no longer what interests us" has been taken literally by a generation of young American architects?

If it has, Alan Dunn has come to restore perspective and humor with THE LAST LATH. When his militant young matron tells her cowering architect, "Where you want mutatative continuity and design correlation, I want a closet," she is giving warning that fifty million individual American housewives stand squarely behind her. And the architect, who has facetiously embodied twin comfort stations in an arch of triumph to "resolve the conflict between the utilitarian and purely commemorative schools of thought," is far from losing sight of even the minor urgencies of a world of individual people.

Henceforth let all who speak of controlled environment, mechanical cores, regionalism, modules and machines for living, beware. Ten to one, listening under their drawing board with pen in hand will be Alan Dunn. Personally — and when you've read THE LAST LATH you'll go along with me — I'm for giving the Gold Medal of the American Institute of Architects to Alan Dunn. What do you say, men?

"Let me tell you what happened in their All-Purpose room . . ." From "The Last Lath"

UN-MODERN ART?

Mona Lisa's Mustache: A Dissection of Modern Art. By T. H. Robsjohn-Gibbings. New York 20 (501 Madison Ave.), Alfred A. Knopf, Inc., 1947. 5¾ by 8½ in. xiv + 266 pp. illus. $3.00.

If T. H. Robsjohn-Gibbings is murdered in his sleep some dark night he'll have only his own caustic humor and his increasingly skillful pen to blame. Not content with the barbs he shot at antique-lovers in GOODBYE MR. CHIPPENDALE a couple of years ago, he has now released a whole quiver-full of poisoned arrows at so-called modern art. MONA LISA'S MUSTACHE is not a book calculated to win friends for its author.

To put it bluntly, Mr. Robsjohn-Gibbings finds modern art neither modern nor art. He doesn't like it. He sees no reason for its existence. He considers it, in fact, rather absurd — "a revival of the systems used in primitive and ancient magic," and not at all an expression of the age in which we live.

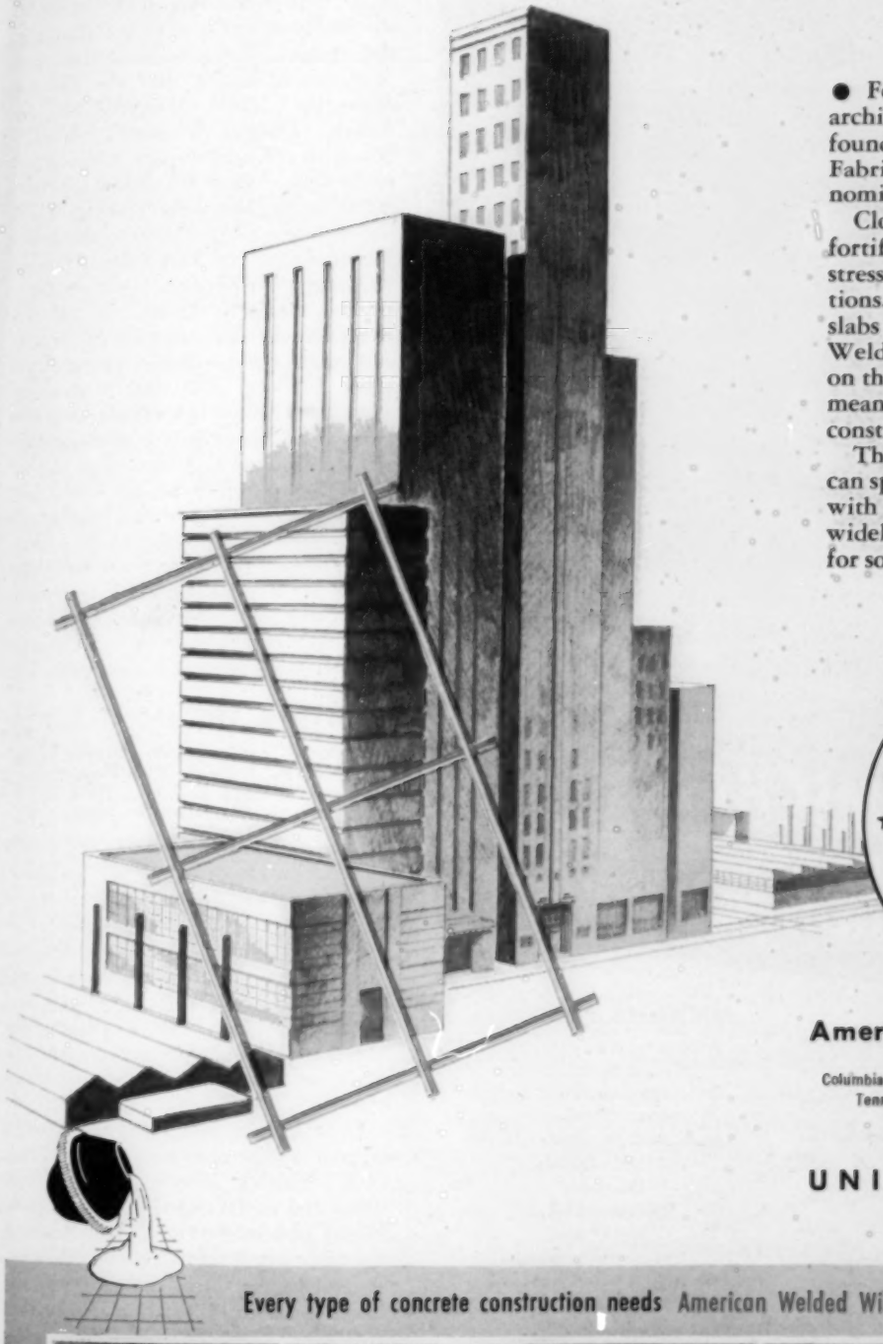
"It is the modern art authorities," says this hardy author, "who are responsible for the misleading cult of aesthetics and 'art appreciation.' To start with the premise that art is sublime and beyond the understanding of the average man, who must therefore be taught to 'appreciate' it, is absolute nonsense. Before the coming of modern art and its spokesmen no one needed a course of 'art appreciation' to understand just what he was looking at. You looked and you liked what you saw or you disliked it. But never did you look and then say: 'Tell me what I am looking at.'"

The poison into which Mr. Robsjohn-Gibbings has dipped his arrows is "Magic." His theme throughout this book is that modern art is nothing more nor less than a revival "of one of the oldest systems for getting power" — a revival of magic. Delving back into the art circles of the 19th century, he tells

(Continued on page 30)

Planning Concrete Construction?

Specify American Welded Wire Fabric



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REQUIRED READING

(*Continued from page 28*)

the story of the Pre-Raphaelite Brotherhood, occult-minded secret society of artists headed by Dante Gabriel Rossetti, "that eternal type of the art world, the charlatan of the esoteric." Gauguin, the Brücke brotherhood of Dresden, Madame Blavatsky and the Theosophists, the cubists, Marinetti and futurism, Picasso, Cezanne, Wassily Kandinsky, Klee, Giorgio di Chirico, Salvador Dali — these are some of the characters in Mr. Robsjohn-Gibbings' modern mystery play. The surrealists, the Bauhaus and New York City's Museum of Modern Art have the leading roles.

MONA LISA'S MUSTACHE (the title refers to a surrealist painting by Marcel Duchamp) never will have any disinterested readers. The anti-modern-art school will love it, will laugh itself into tears at the biting humor of the author, will quote it *ad infinitum*. And the infuriated multitudes on the other side of the fence will gird for battle, will excommunicate the author for his heresy, and will ban the book from the circles of the art literati. Crusader or traitor, Mr. Robsjohn-Gibbings obviously had a fine time writing this book — but sooner or later he is sure to hang for his wit.

LIGHTING THE HOME

Residential Lighting. By Myrtle Fashbender. New York 3 (250 Fourth Ave.), D. Van Nostrand Co., Inc., 1947. 8½ by 11 in. 270 pp. illus. $10.00.

Described on the jacket as "a one-volume encyclopedia of all the basic facts on the arrangement and design of home lighting — for apartments or houses — for building, remodeling or decorating," this is a book more for the home owner, the interior decorator and the electric appliance dealer than for the architect. It should, however, prove a useful addition to the architect's reference shelf.

Even the most non-technically-minded layman will be able to understand this book. Writing clearly, using simple terms and explaining them as she goes, Miss Fashbender (Director of Residential Lighting, Lamp Division, Westinghouse Electric Corp.) has covered the entire residential lighting field from equipment to distribution curves. She has an excellent chapter on "The Influence of Period Styling on Lighting Fixture Design" and two on portable lamps. Her section on home wiring is thorough, including a schematic drawing of a typical electric wiring system for a two-story house, diagrams of various types of outlets, a table of electrical symbols, and a sample first floor plan showing recommended placement of lighting

(*Continued on page 160*)

ARCHITECTURAL

RECORD

LOOKING FOR TROUBLE

THERE is a certain satisfaction in looking for trouble — especially when you know in advance that you are going to find it and know what to look for and where. Detectives and investigators have the satisfaction of pointing with pride at their prowess in discovering clues and following them to the apprehending of the culprits. And the public enjoys the drama of the exposé and relishes the saddling of blame on guilty parties.

So the present investigations of the complex building industry to determine who killed the Cock Robin of housing with the arrows of high costs, will be full of convincing facts and figures, dramatic incidents and examples. And each factor in the industry will have the satisfaction of having the investigators' finger point accusingly at the bad boy across the table. Of course, it will be the other fellow who is mostly to blame. Even the architect may be questioned to find out if his designs and plans are factors in the high costs of building, either through his lack of knowledge of the economics of building, or lack of scientific data necessary for economic building, or just the ineptitude of the perfectionists. He can hardly be successfully accused of inordinate profits from his profession.

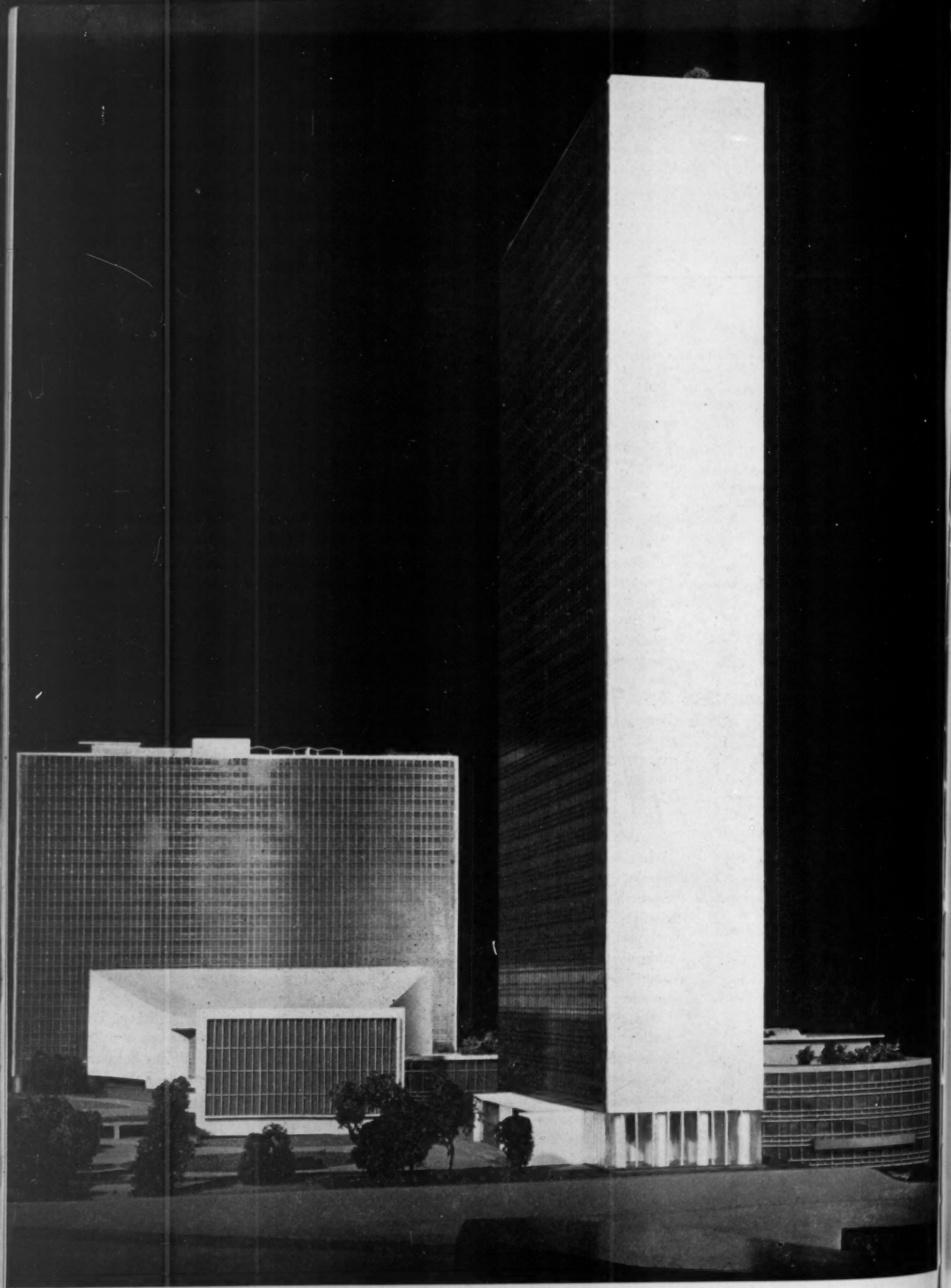
Almost any architect could write volumes on the troubles the investigators will unearth, the "astounding abuses" in the industry that will be spread with such satisfaction to the public gaze. He could cite chapter and verse on the restrictive practices of labor, the high costs of materials and equipment, the restrictions of obsolete building codes, the red tape, unreasonableness, and shortcomings of government agencies (local, state, and national).

In this welter of easily enumerated specific troubles, abuses, or inefficiencies on the part of each factor in building — from raw land deals through real estate practices, financing systems, material and equipment manufacturing, marketing and distribution practices, to on-site labor squabbles — the investigators may lose sight of such overall influences on high costs as that ole debbil "supply and demand," the inevitable postwar inflation (devaluation of the dollar), the national debt, the government's own fiscal and tax policies, even the influence of political expediency on such policies.

On the whole we believe the effect of looking for trouble will be salutary. The building industry's shortcomings will be found to parallel the shortcomings of other industries rather than being unique. Incidentally, the advances the building industry has made in finding and alleviating its own troubles may be brought to light. It is our contention that the value of the investigations should be measured not in terms of the dirt excavated, but in terms of solutions to the troubles that beset us. And it is our belief that the measures for the solutions of such troubles will come from the industry itself rather than from critical master-minds.

Kenneth K. Stowell

EDITOR



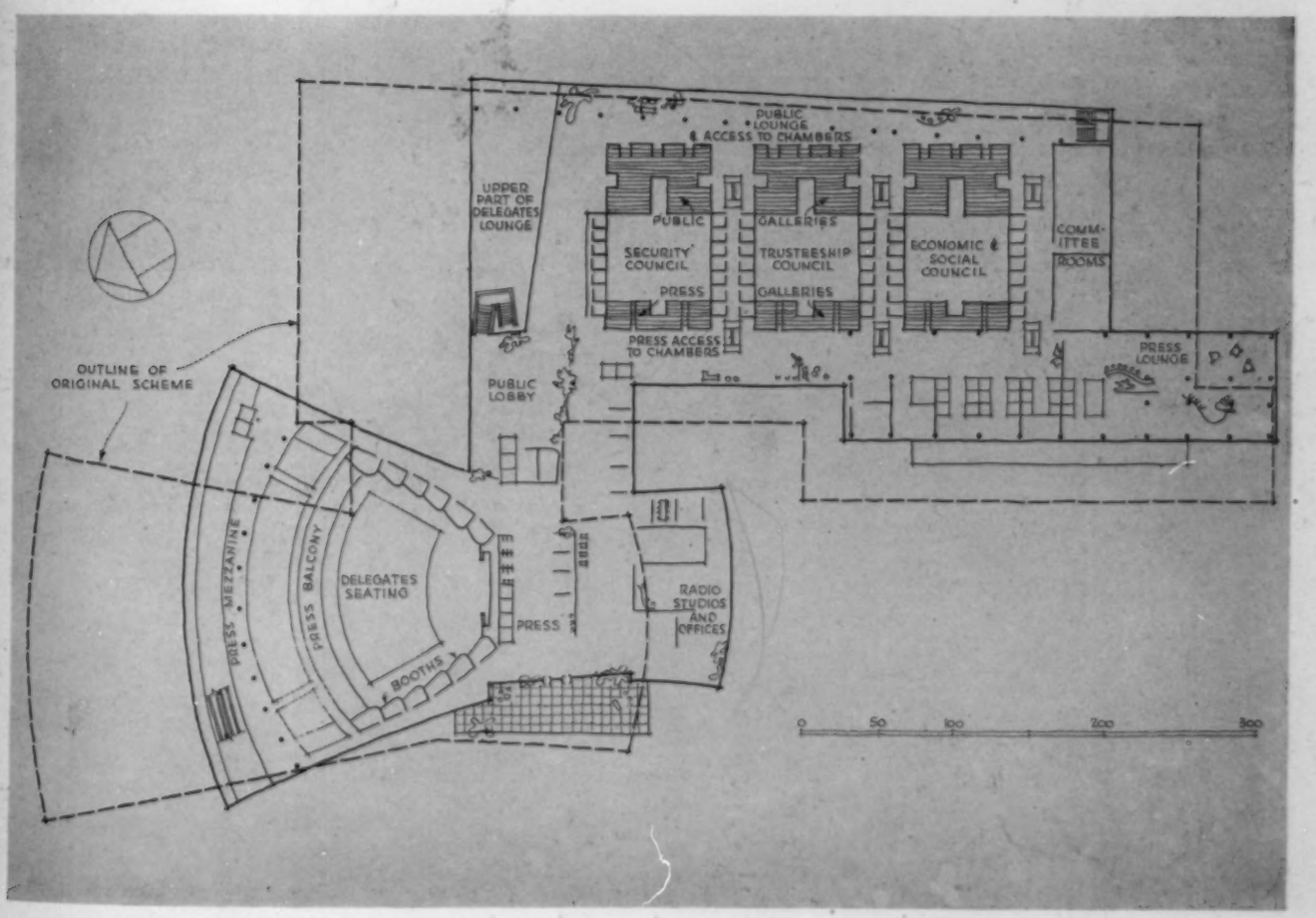
U.N. HEADQUARTERS REVISED FOR ECONOMY

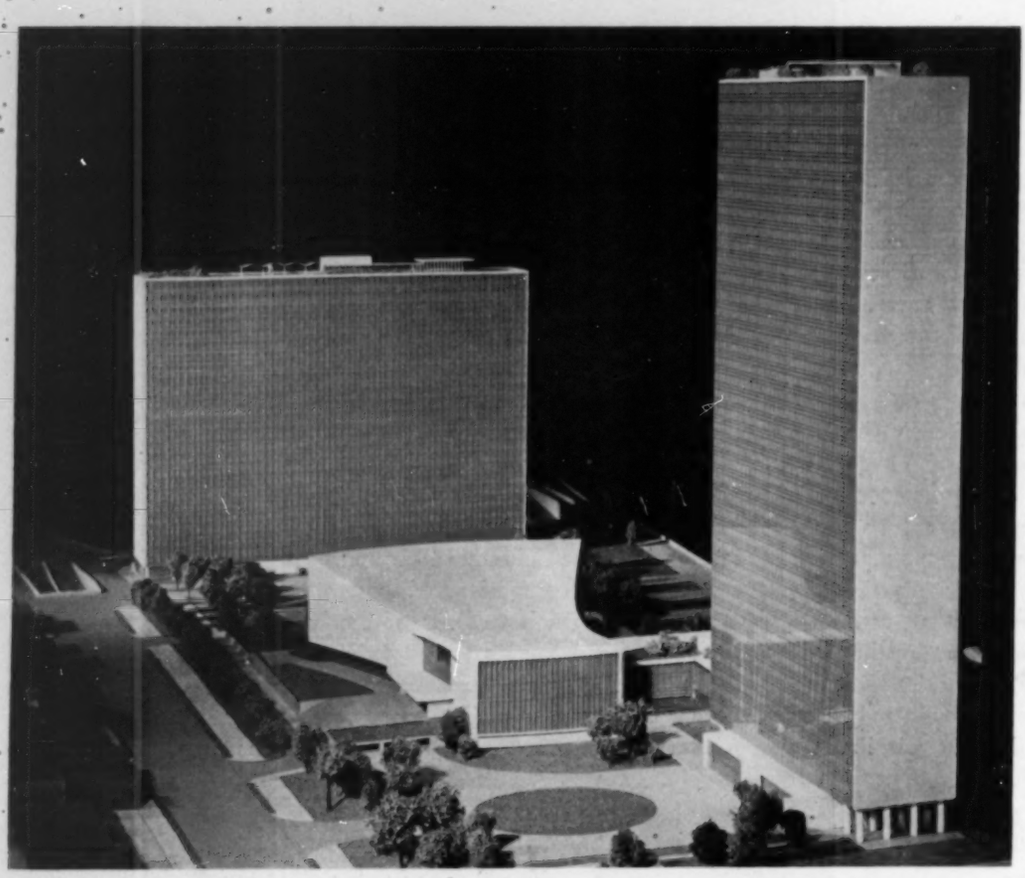
To the anxious many who hope that improved relationships in the international family will result from early settlement of the United Nations in its permanent headquarters, the 1/20-scale model of the revised project currently on exhibit at Lake Success shines as a symbol of progress.

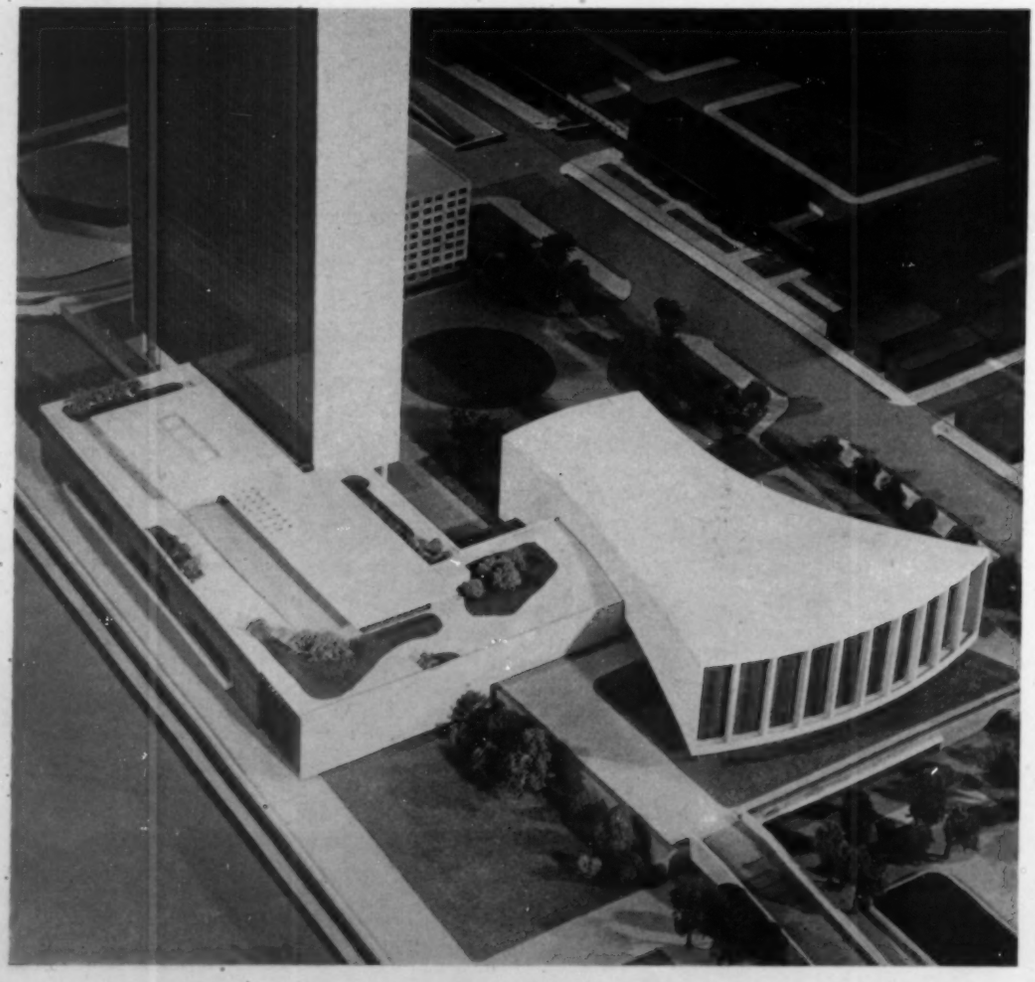
Months of intense collaboration by the international planning group, under direction of Wallace K. Harrison (for associated personnel, see Architectural Record, April, 1947, p. 75), culminated last July in a Report to the General Assembly, presenting exhaustive analysis of requirements, and plans for accommodating delegates, secretariat, press and public at an estimated cost of $85,000,000. Review of the report by the Headquarters Advisory Committee brought praise and approval for the planning results in general, but a judgment that the scheme must be modified to fit within an estimated figure of approximately $65,000,000, at current levels of cost. During the next few weeks, the planning group pared the project down to the dimensions represented by the model.

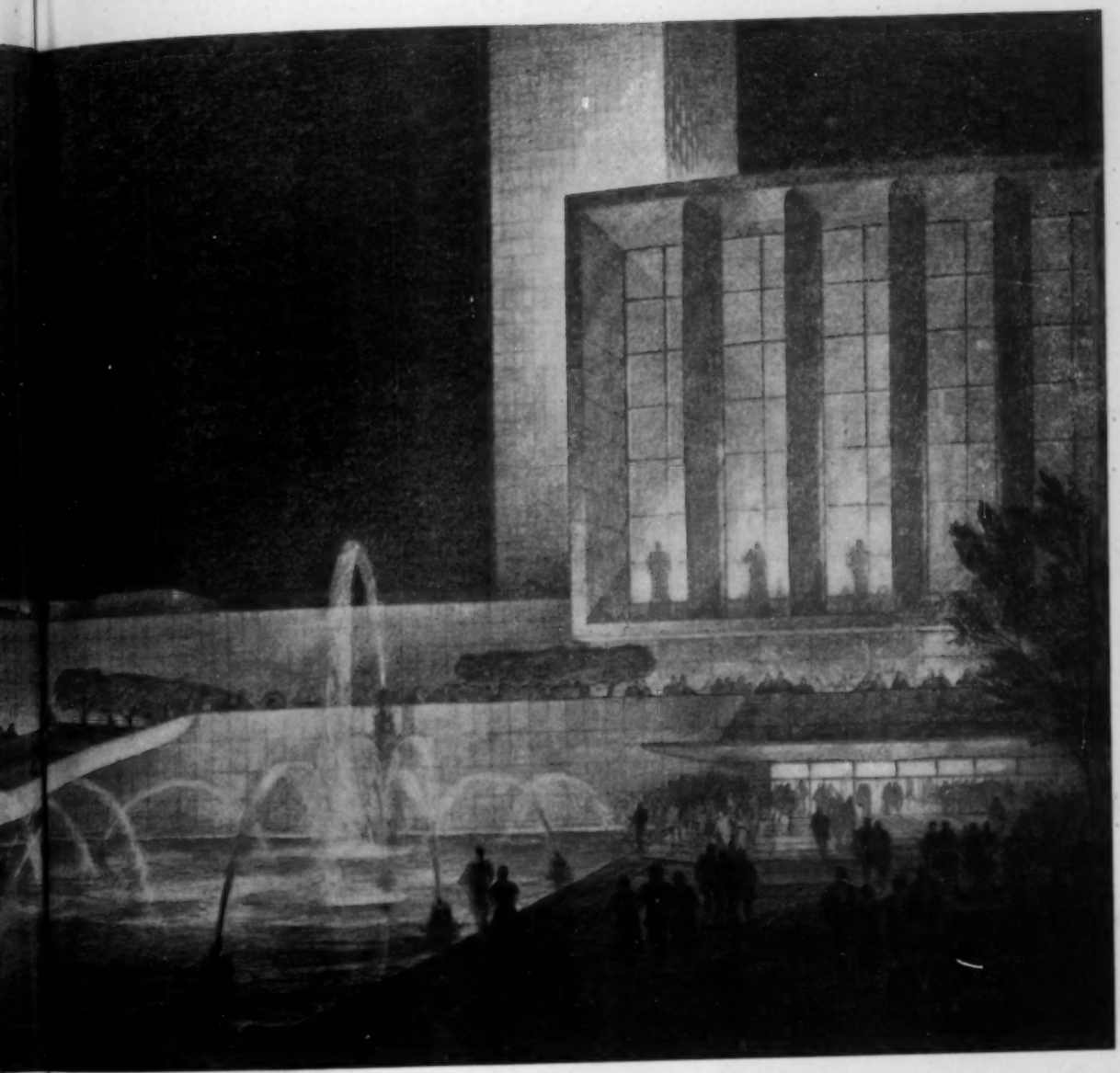
Meanwhile, the original Headquarters Advisory Committee was dissolved, to be reconstituted as an *ad hoc* committee with practically the same membership from 16 nations, and Warren K. Austin again as chairman. "Approval in principle" has been given by this group to the revised scheme, which rests at this writing with Committee No. 5 of the General Assembly. This body is now debating means of raising the necessary funds.

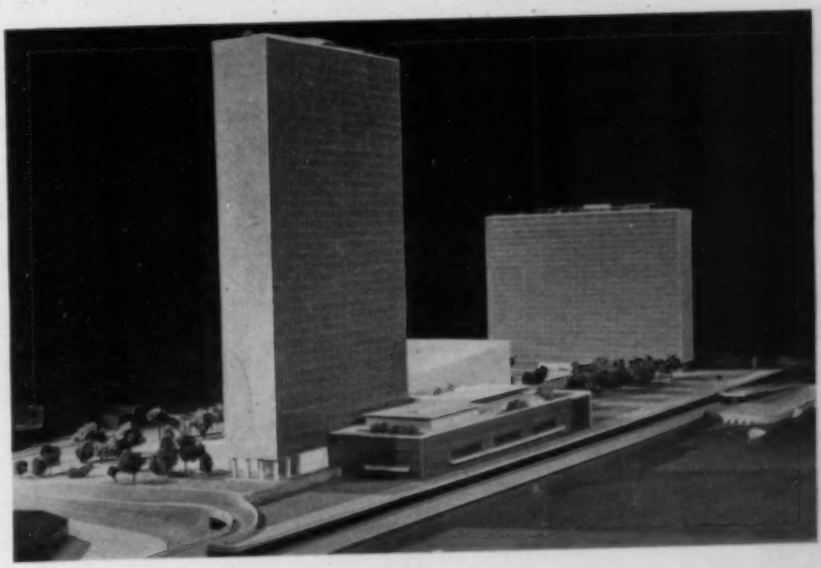
The plan below shows the revised scheme of Assembly and Secretariat Buildings at the press and public level. The dotted outline is that of the original plan as presented in the July report, issued recently in book form by the Columbia University Press, New York. Level-by-level comparison of the two schemes shows that space savings have been accomplished by closer figuring of requirements both by users and by planners. Some elements have been rearranged for economy; others have been combined, where restudy indicated adaptability to dual-purpose arrangements. Some originally contemplated facilities such as the central library have been deferred for later addition. It is apparent throughout that convenience and efficiency have not been sacrificed, nor does the revised scheme show any considerable diminishing of amenities or impressive architectural character in the group as a whole.



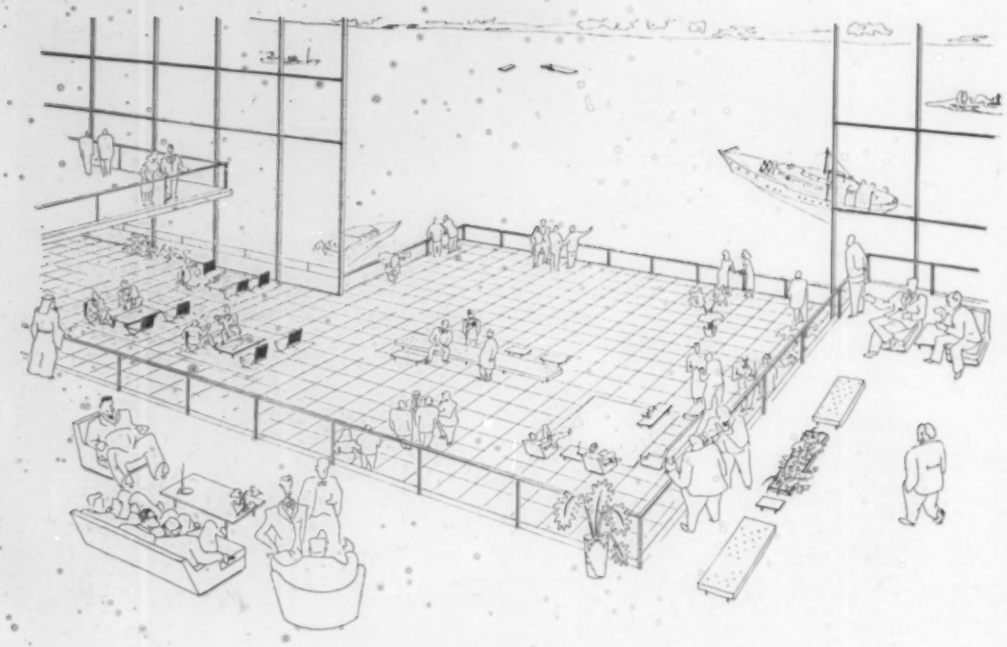




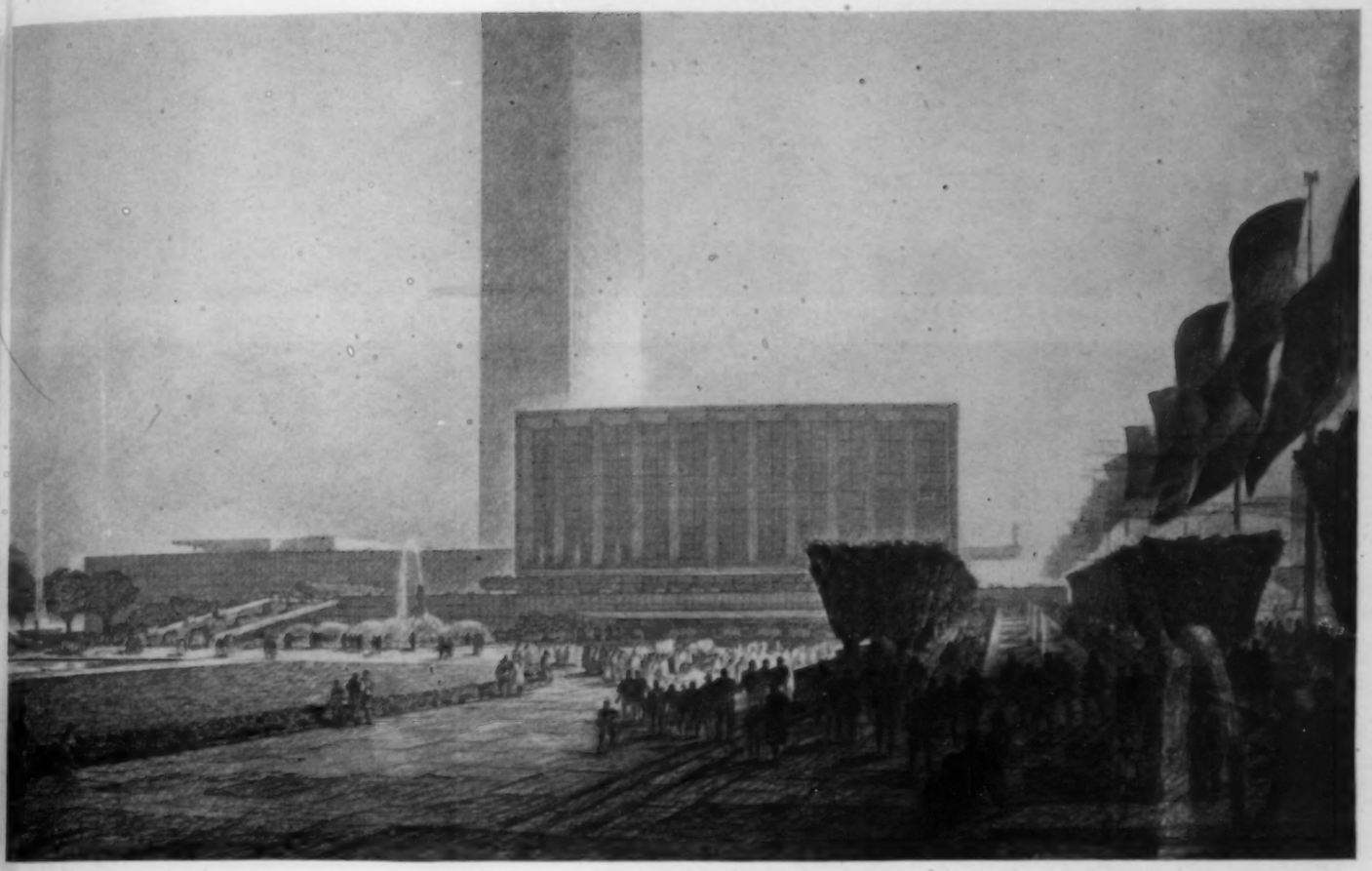


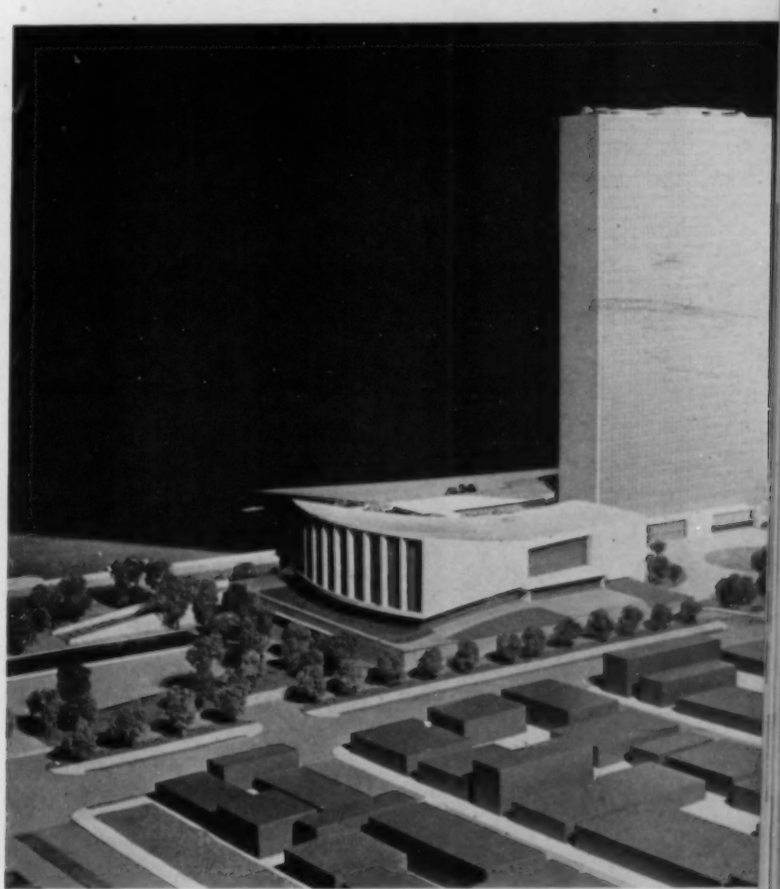


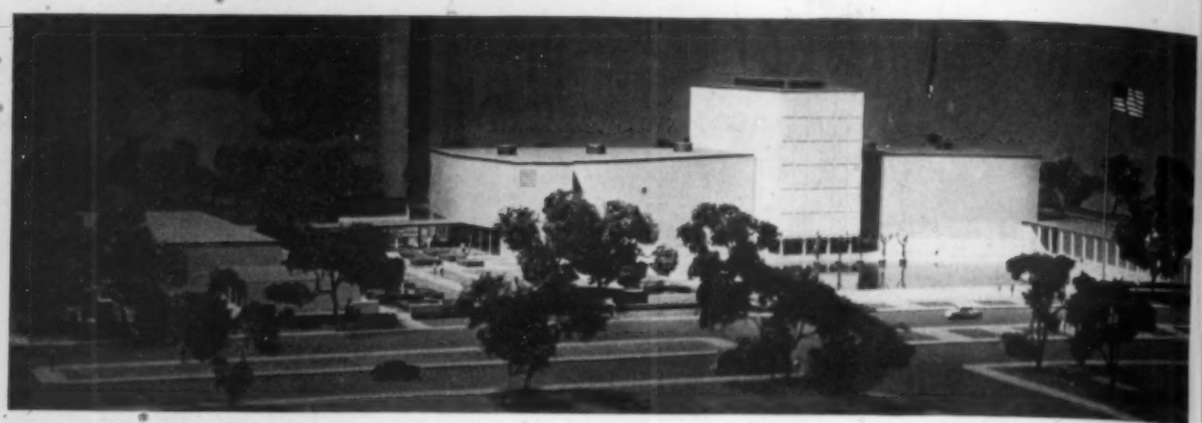
View of model at top, left, is from southwest showing entrances for delegates, secretariat and press. Vehicles enter circular drive from upper level of First Ave., deposit passengers and continue around to sub-level parking ramp. Visible over tree tops in right foreground are entrances for secretariat and press, giving immediate access to Secretariat Building elevators. Delegates continue in their cars to elevators just inside the parking-ramp entrance, which carry them up into the General Assembly Building; or they may go by way of the alternate drive off First Ave., up stairs to the terrace, and thence into the assembly areas. View left, below, shows public entrances, one into the Assembly Building from terrace level and one from public-plaza level, shown more clearly in the rendering by Hugh Ferriss (above). View at right is from southeast; council building in foreground

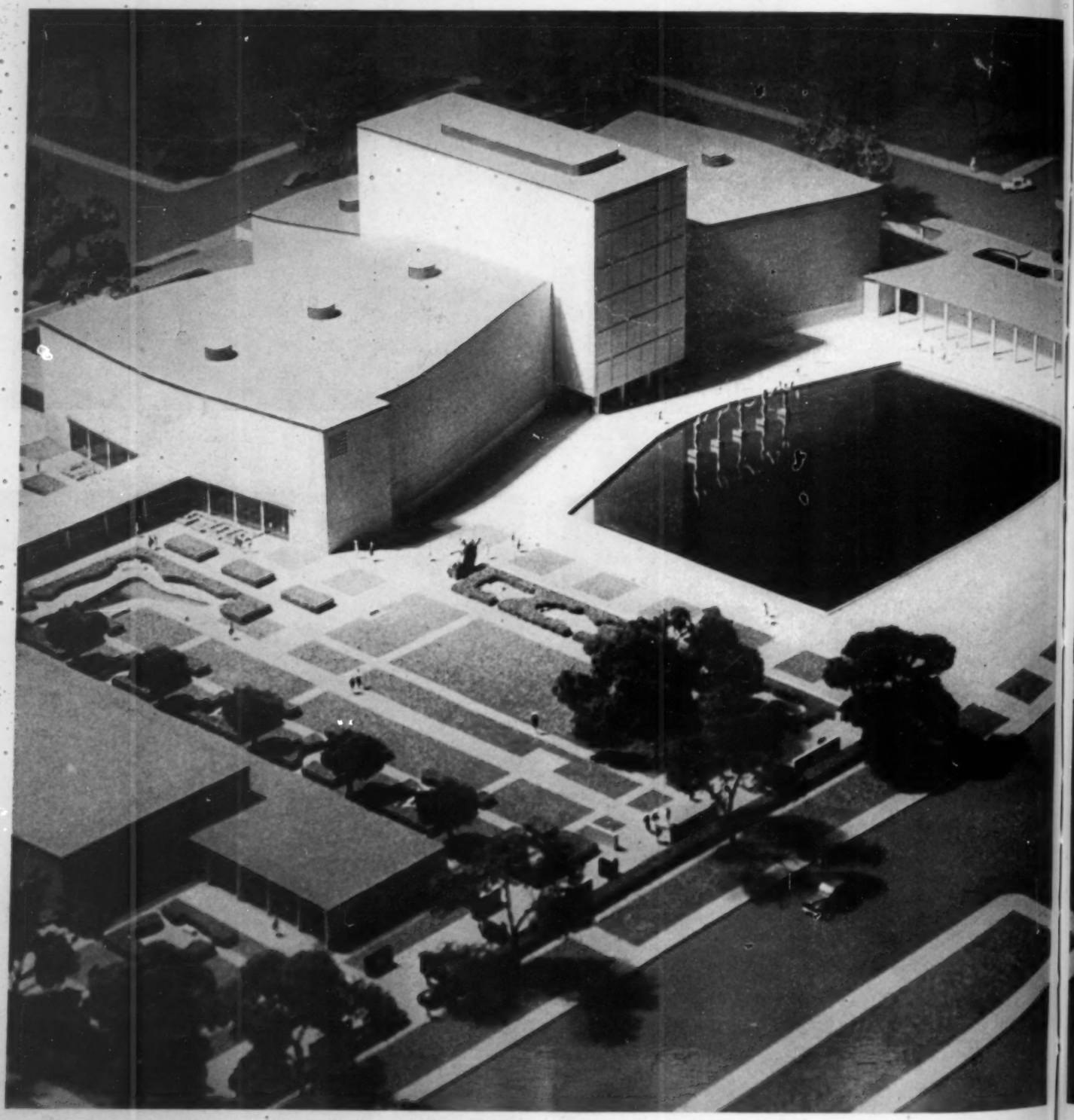


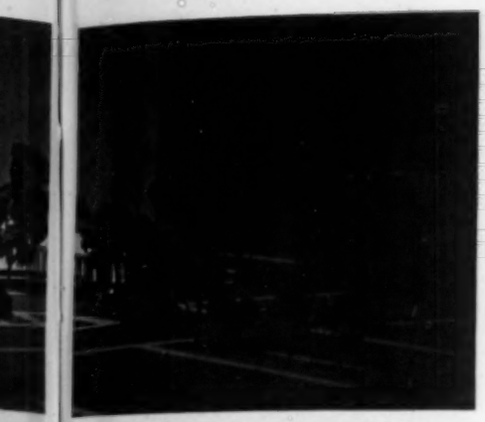
Savings in the revised scheme were achieved with very little reduction of amenities. Sketch above shows delegates' lounge overlooking the East River (see plan, page 69, for its position in the council and committee building, on the roof of which is the delegates' restaurant). These features are considered of particular importance not only for individual convenience and relaxation, but as gathering points where discussions may be continued informally between meetings, and friendly relationships developed. Plans also indicate similar facilities for public, press and secretariat, with a restaurant for the latter atop the Secretariat Building. Ferriss rendering, above, presents a broad view over the plaza to the south, giving an impression of the scope and scale of the project from a public standpoint. Photo of the model at immediate right shows the East River boat landing and the extension to be made at plaza level over Franklin D. Roosevelt Drive. Vehicular ramp, for access of northbound traffic to the Drive from 48th St., will be matched by a similar ramp at 42nd St.; both will be contributions to the site by the City of New York. Underneath the plaza will be parking garages, with northern entrances visible to right of the ramp; trucking service to the Headquarters will enter at this level. Photo at far right is a view from the northwest. Note at lower left hand corner the projected widening and landscaping of 47th St., which will be the principal public approach to the Headquarters. This will be another contribution in the New York City program of approximately $15,000,000.

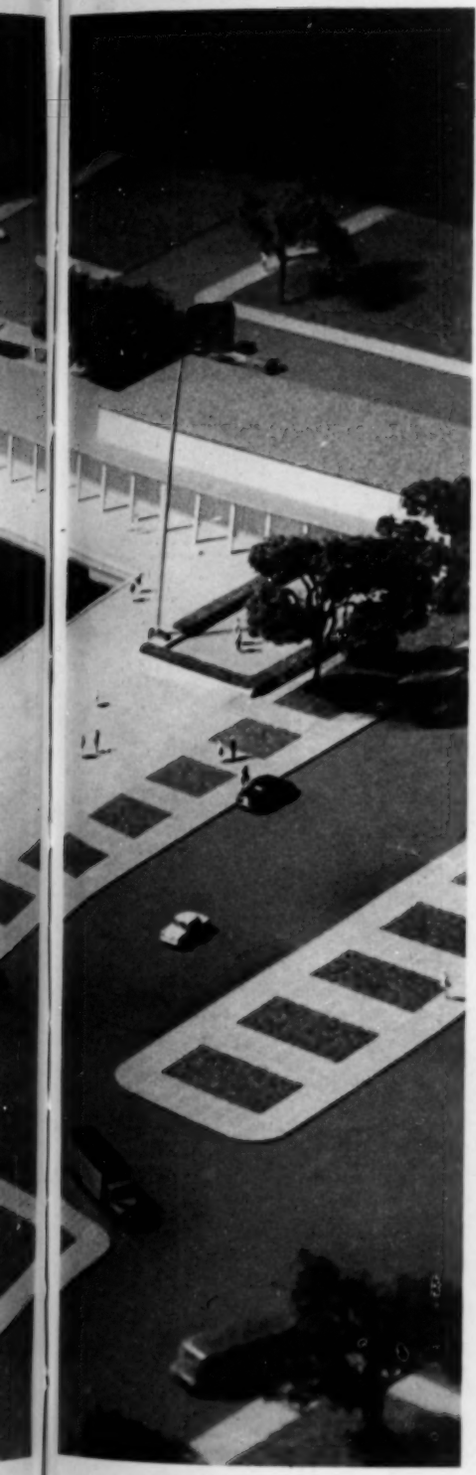












MILWAUKEE'S PROPOSED MEMORIAL CENTER

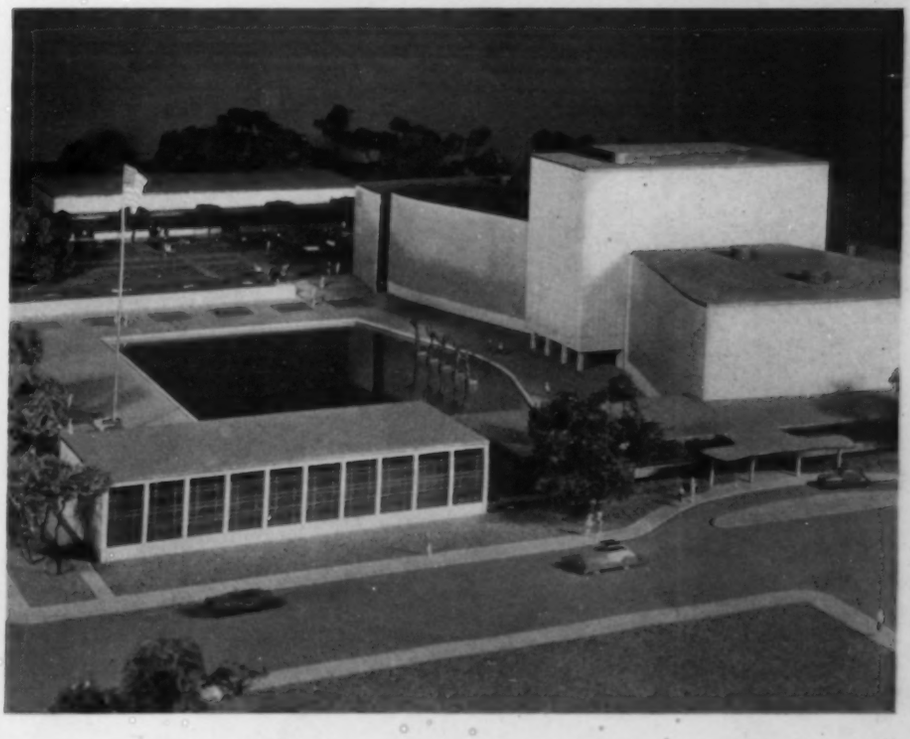
Preliminary studies by Saarinen, Swanson and Saarinen, Architects

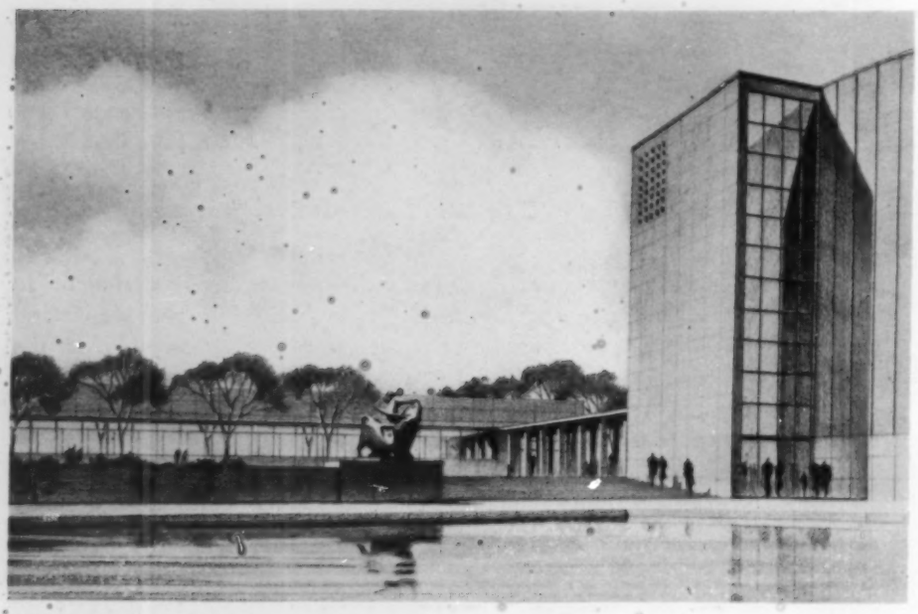
THE Milwaukee County Memorial Center has been definitely designed "to serve the living while honoring the dead." It is planned to provide central facilities for music, drama, art, public discussion and special assembly. In the words of its sponsors, "It will be no dull, lifeless statue. It will be a warm, vibrant, throbbing, living community center where all Milwaukee County's sons and daughters will learn to *live* by more than bread alone."

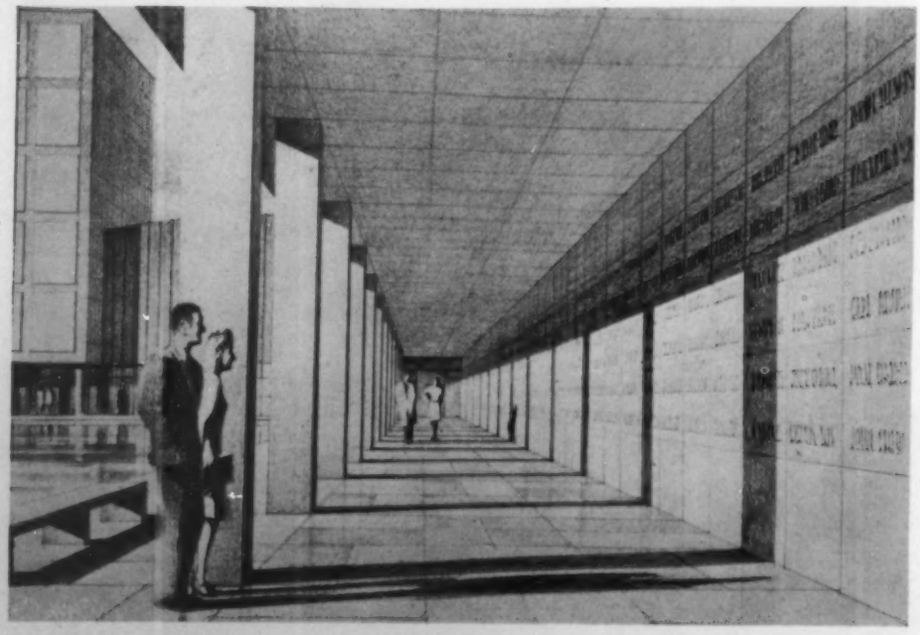
The central building is divided into three "audience units" which are served by the single central stage house. The main hall will accommodate approximately 3500 persons, the others 1500 and 500, respectively. There are to be smaller rooms for meetings, conferences and office space for veterans' groups. One wall of the long Memorial Arcade will bear the carved names of those who died in the service of their country. The third large unit of the group is to be a community art gallery which will house not only exhibitions, but facilities for education, study and training in actual work in the arts.

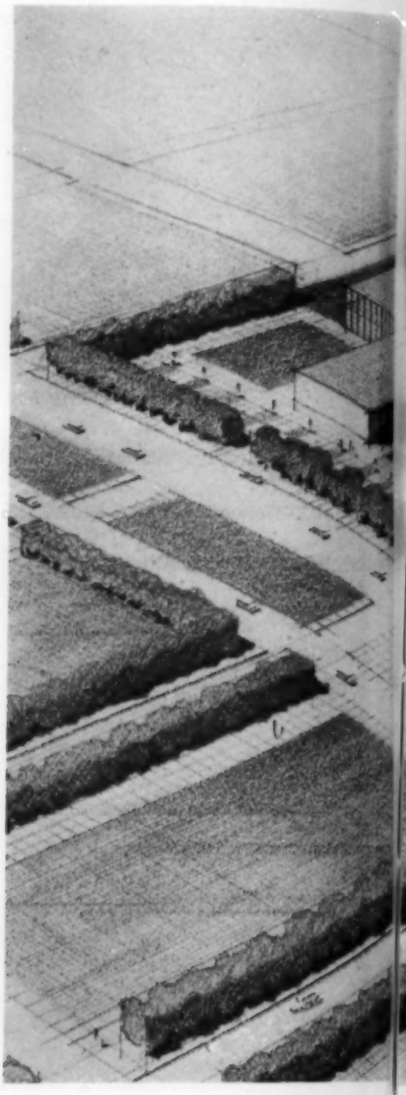
The model shows the three Audience Units and central stage house flanked on the right by the Veterans' Memorial Hall and administrative offices, and on the left by the Community Art Gallery. Right: the architects explaining the model

Fred R. Stranger Photos





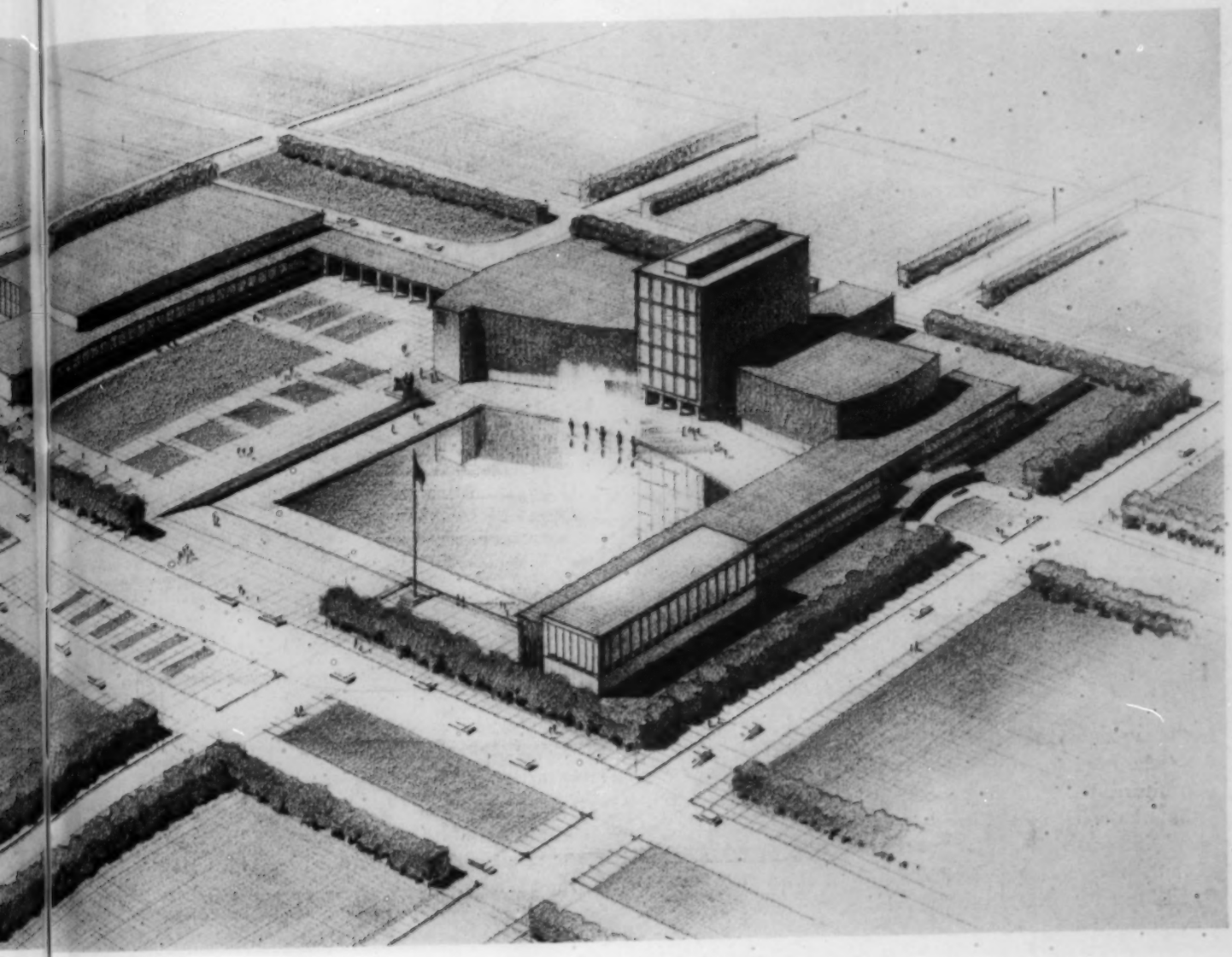




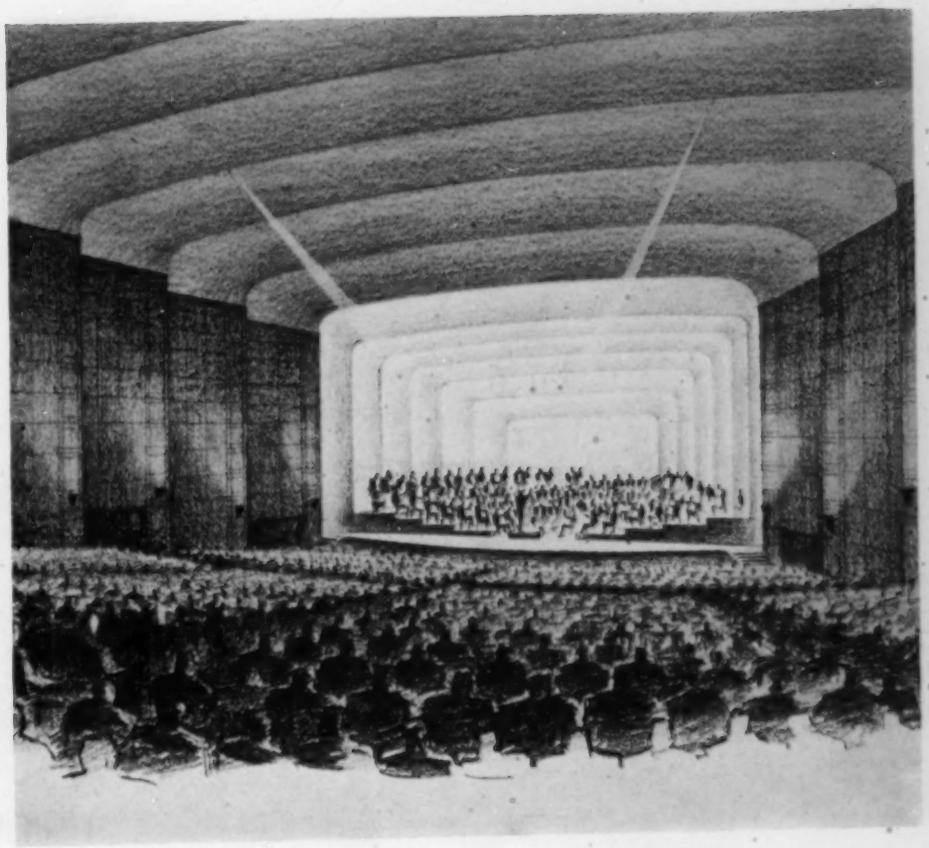
Left, top: reflecting pool of the court, with Art Gallery beyond and a portion of the large Audience Unit (right)

Left, center: entrance and marquee serving both Audience Unit II and the administration wing of the Veterans' Memorial Hall

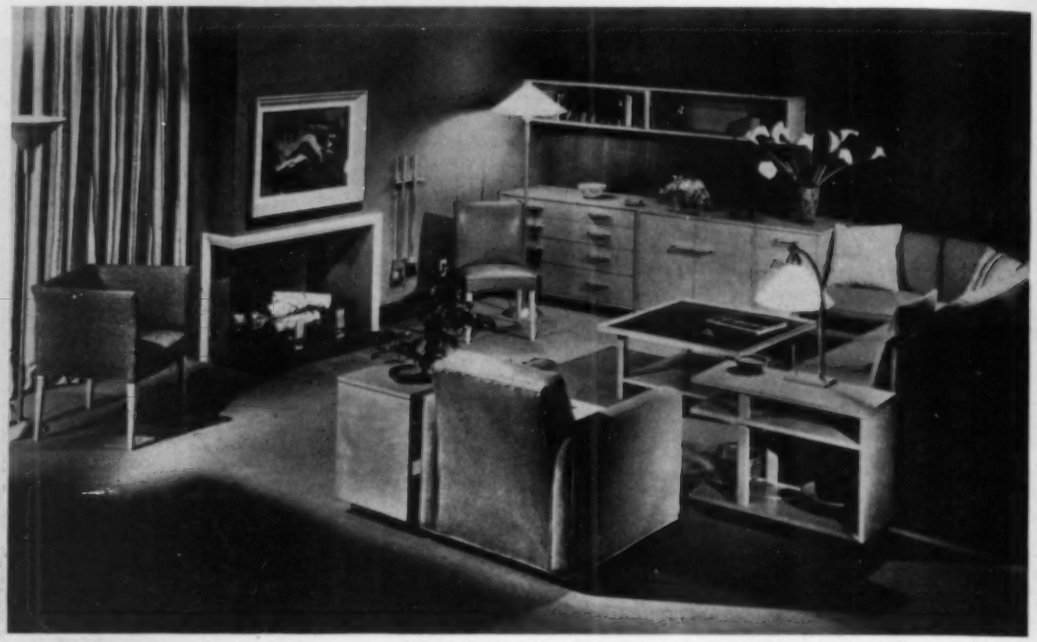
Left, bottom: the Memorial Arcade of the central court



Above: bird's-eye view of the group showing triple Audience Unit building is flanked at the left by the Art Gallery, at the right by the Veterans' Memorial wing



Right: a portion of the largest of the Audience Units



The furniture takes full advantage of the beauty of natural birch, is simple in line, pleasing in proportion. Some upholstered pieces make good use of foam rubber, covered of course with distinctive fabrics

COORDINATED INTERIOR DESIGN

The Saarinen-Swanson Group

CREATORS of modern dwellings have long realized the need for equally contemporary designs for furniture, fabric, floor covering and accessories so that the spirit of the architecture would permeate and integrate the entire ensemble. With this in mind, the Swansons — Robert F. Swanson, architect, and Pipsan Saarinen Swanson, designer — set about producing both furniture and settings for the Johnson Furniture Company of Grand Rapids. Collaborating artists were Marianne Strengell, textile designer; Lydia K. Winston, ceramist; Charles Dusenbury, sculptor; and Ben Baldwin, architect designer. The result is that from furniture to fire-irons, from lamps to linen, from carpet to coverlet, there is harmony in spirit, form, scale and color. The rooms are alive, cheerful, colorful and livable.

James Bayne Photos

Another living room setting, somewhat simpler without the chests and cabinets of the living room above. At the right is the comfortable and convenient card group

Two dining rooms while the same in spirit differ in detail. There is infinite variety in the design possibilities of grouping cabinets and chests for various uses. The tables are ingeniously extensible to provide for family or festive occasion

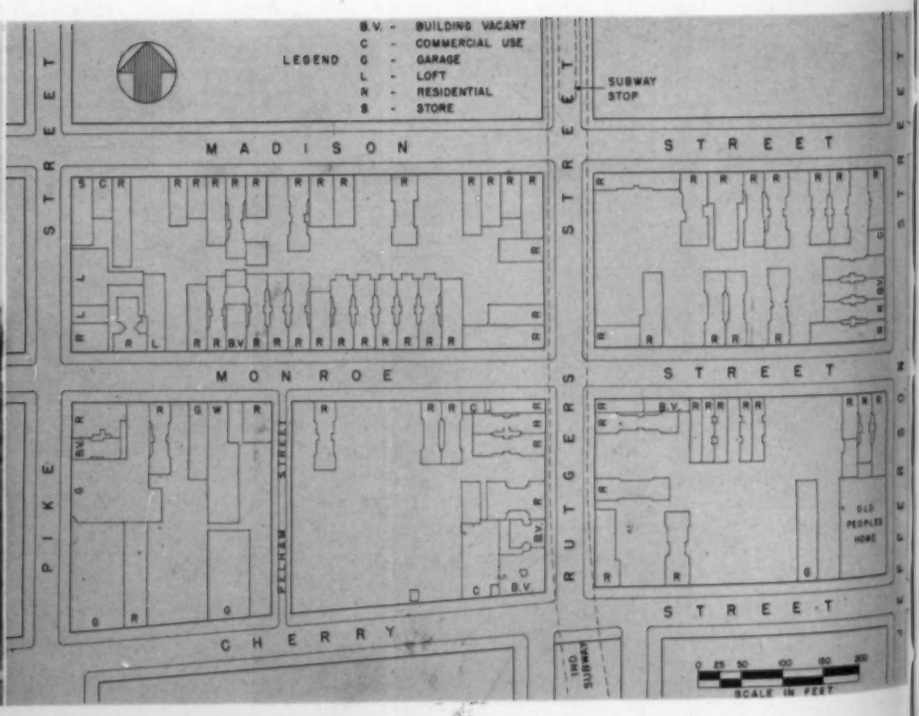
Standard pieces may be ranged side by side or superimposed as need or taste dictates. Bed tables vary in design and use, and lamps are conveniently placed for reading in bed. Textiles, while machine woven, have the character of hand loomed fabrics

Left: an interesting and comfortable desk and chair. Above: a larger bedroom with convenient chests of drawers and bookcases

A PLAN

Floyd Yewell, del.

The pentagonal apartment plan adopted for Farragut Apartments, New York City Housing Authority, is here developed as a way of providing large-scale rental housing for tenants in higher income brackets. Such projects would, it is contemplated, be financed by private capital, insurance companies and other long-term investors. Below is a typical lower East Side site in its present condition; on the opposite page, as developed with pentagonal apartments



FOR MIDDLE INCOME RENTAL HOUSING

By Carl A. Vollmer, A.I.A., associated with Fellheimer & Wagner, Architects

THERE has been much discussion recently in New York City on the subject of middle income rental housing. It has almost been taken for granted that private enterprise has abandoned this field and that rental housing for the middle income group must be left to government. This country did not grow great on such a defeatist policy in any other field of endeavor, and the building industry and investment community must take up the challenge in this instance.

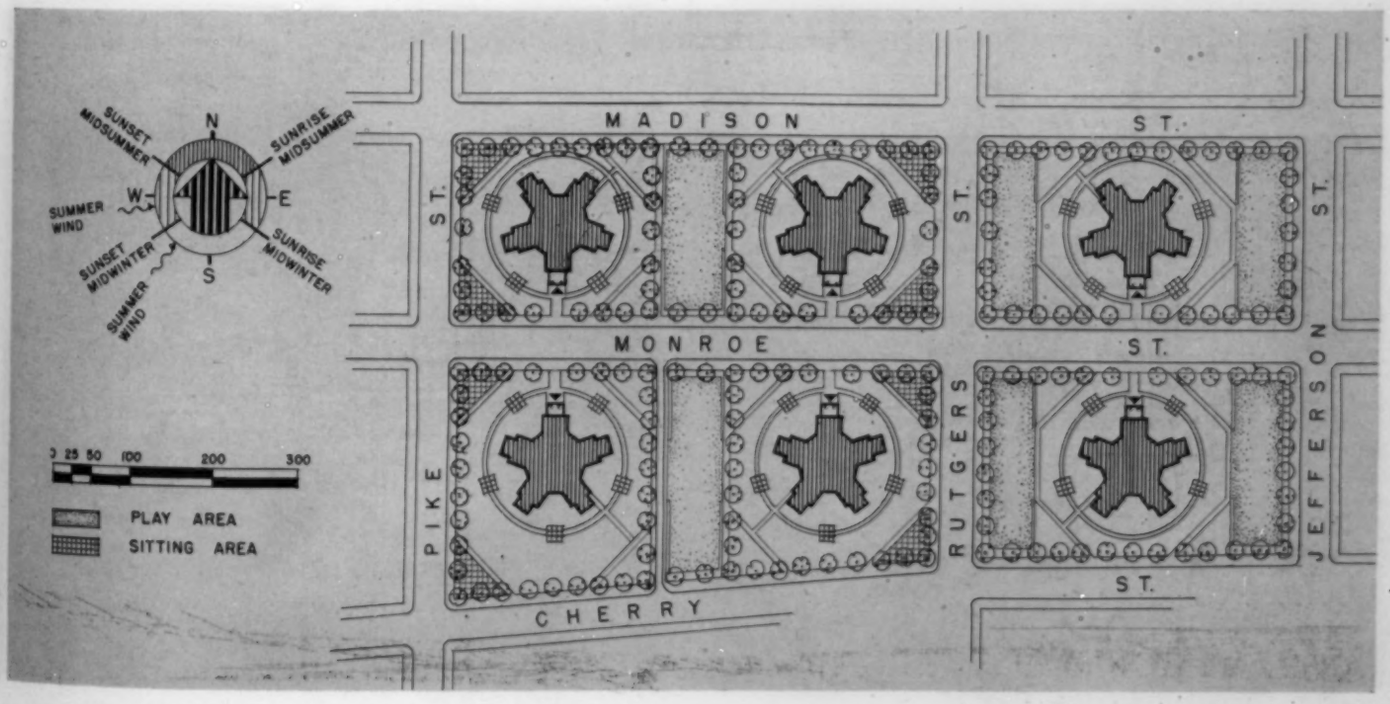
Private enterprise can, with the financial tools at its disposal, make a substantial advance toward the goal of middle income rental housing by more progressive architectural planning.

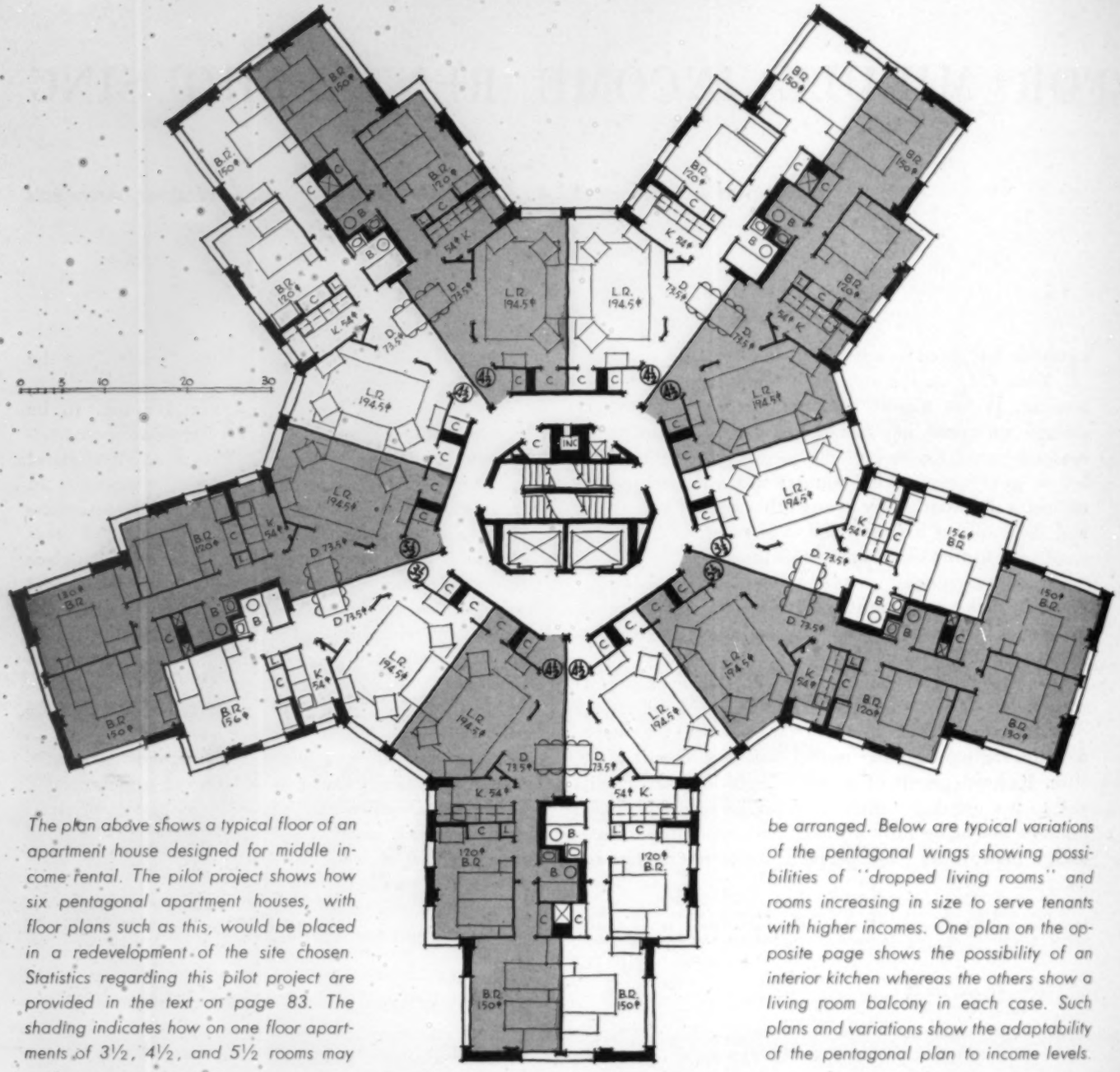
One of the primary aims of a good plan for an urban community should be the elimination of blighted, congested areas. This would obviate the need for costly decentralization and the use of outlying vacant land sites. Redevelopment of a central run-down area will put to use existing utilities and public services which are now not being fully utilized; and, most important, such a plan would place people close to the centers of employment and thus save the strain, the time and the expense of long travel to and from work.

A plan for middle income rental housing, to be successful, must also lend itself to large-scale construction and neighborhood planning. It is desirable to avoid the necessity of closing existing public streets — an undertaking which may require protracted negotiations with public agencies. Furthermore, in congested areas there usually are found intricate networks of sub-surface utilities — public and private — and an economical plan for such an area should minimize the need for the costly removal, relocation or bridging of such utilities. Of major importance, also, a successful architectural plan must provide generous open space for the residents within the boundaries of the project, as well as for the improvement of the surrounding neighborhood. In the course of replanning a blighted and congested area, a very open housing site plan will provide much needed space for playgrounds and other recreational activities in areas which usually lack these elements for good living, and which would otherwise be very costly.

Several years ago the New York City Housing Authority demonstrated the economy and feasibility of planning and constructing six-story elevator buildings

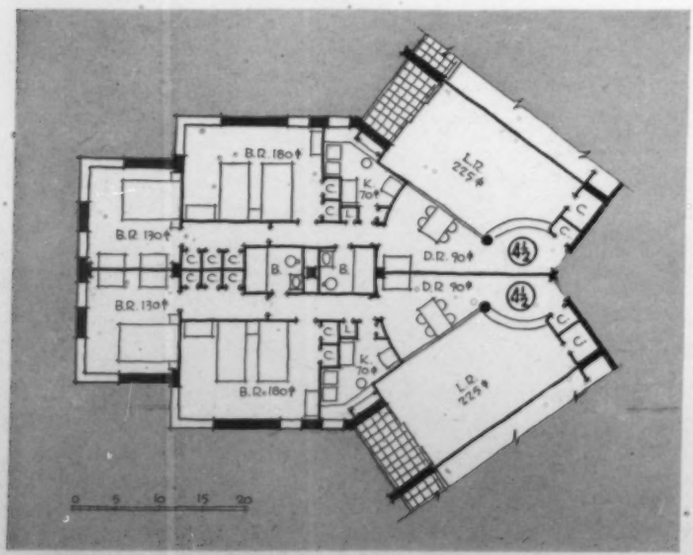
The author gratefully acknowledges the helpful advice and assistance of Maxwell H. Tretter, formerly Executive Director of the New York City Housing Authority; William C. Vladeck, formerly Chief of Planning of the New York City Housing Authority; Fred N. Severud, Structural Engineer.

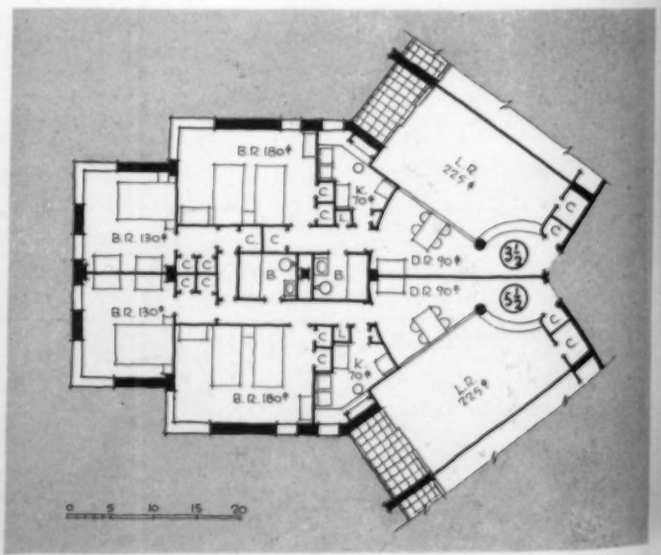




The plan above shows a typical floor of an apartment house designed for middle income rental. The pilot project shows how six pentagonal apartment houses, with floor plans such as this, would be placed in a redevelopment of the site chosen. Statistics regarding this pilot project are provided in the text on page 83. The shading indicates how on one floor apartments of 3½, 4½, and 5½ rooms may be arranged. Below are typical variations of the pentagonal wings showing possibilities of "dropped living rooms" and rooms increasing in size to serve tenants with higher incomes. One plan on the opposite page shows the possibility of an interior kitchen whereas the others show a living room balcony in each case. Such plans and variations show the adaptability of the pentagonal plan to income levels.

Plans copyrighted





as against the accepted two-story row houses and the three- and four-story walk-ups. The Authority proved that there are numerous advantages to planning in height. In planning for the postwar period, the New York City Housing Authority extended the principle of high-rise buildings and approved project designs with buildings rising thirteen, fourteen, and sixteen stories. Regardless of any individual feelings towards public housing in general, self-interest of the building industry requires that it take due recognition of these advances in the *planning* of large-scale housing developments.

When the New York City Housing Authority accepted — for Farragut Houses — the pentagonal plan, conceived by Fellheimer-Wagner-Vollmer, a unique advance was made in site and unit planning of large-scale housing projects. With some variations, the Farragut Pentagonal Plan may be adapted for middle income private rental housing with great success and resulting economies in construction and maintenance costs.

For an illustration of the pentagonal plan for this type housing, a four-block area was selected in the lower east side of Manhattan. In this pilot project no innovations are attempted in the well tested specifications and type of construction adopted by the New York City Housing Authority for Farragut Houses.

There are, however, some material modifications in the private housing pentagonal plan as compared to Farragut Houses: for example, the room sizes have been increased — on the average, about 20 per cent. Mechanically ventilated interior bathrooms have been provided. The buildings have been raised to 18 stories each, as compared to 14 stories in Farragut Houses.

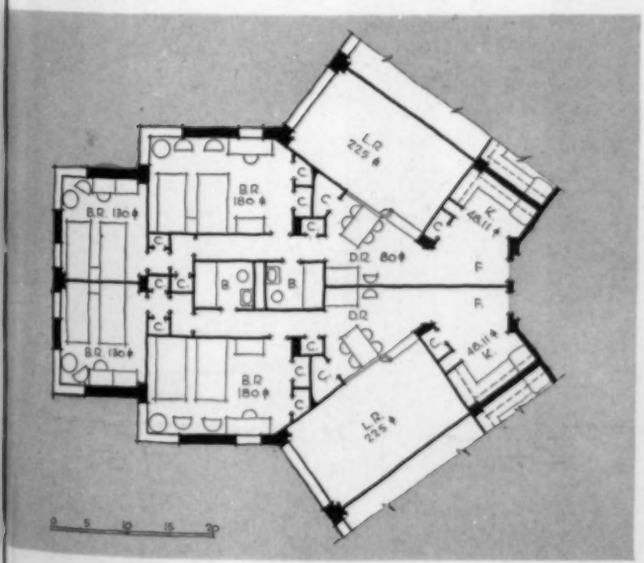
The overall dimensions of each building are confined to a diameter of 137 ft. 0 in., enabling its use in small blocks without the closing of streets. The buildings are sufficiently set back from the building line to permit the 18-story height in a "one-times class" height district with only 60 ft. 0 in. streets. The building coverage is 14.65 per cent of the site, considering only the area within the property line of each block; if the site is considered to include the area of the open streets within the project, the coverage is only 12.62 per cent. Furthermore, even with this concentrated building area the plan takes full advantage of the New York State Multiple Dwelling Law allowing a maximum of 40 rooms per floor for minimum stair widths.

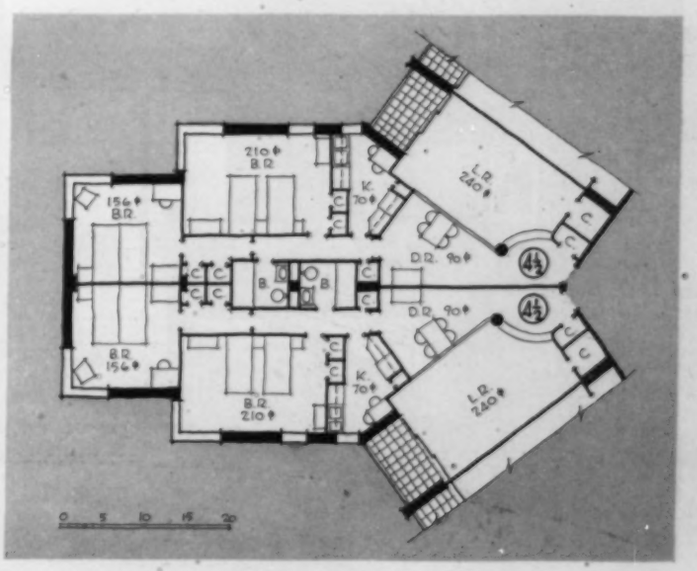
Data on Pilot Project Site Plan

No. of Buildings — Pilot Project	6
No. of Stories each Building	18
No. of Dwelling Units	1080
No. of Self-service Elevators (500′ per min.)	12
No. of Construction Rooms per Building	718
No. of Construction Rooms per Floor	40
No. of Dwelling Units per Building	180
Area of each Building — Typical Floor (sq. ft.)	9163
Area of Construction Room (sq. ft.)	229
Perimeter of each Building — Typical Floor (ft.)	579.5
Perimeter of each Dwelling Unit	57.95
Perimeter of Average Construction Room	14.4
Total Construction Rooms — Pilot Project	4308
Building Coverage (on net lot area)	14.65%
Density — Persons per Acre	459
Number of Incinerators	6
Number of Stairs	12

The rental for each full room in this pilot project is $26.14 per month. This rental is computed on the basis of the following data:

1. Full taxes, at a rate of 3 per cent.
2. Debt service factor (interest and amortization combined): 5.05 per cent.
3. Land cost: $5.50 per sq. ft.
4. Density: 459 persons per acre.
5. Total development cost (exclusive of land): $2,500.00 per room.
6. Management cost (per room per year): $70.00.





7. Vacancy and collection loss: 5 per cent of gross rent.

Each of these factors bears some discussion.

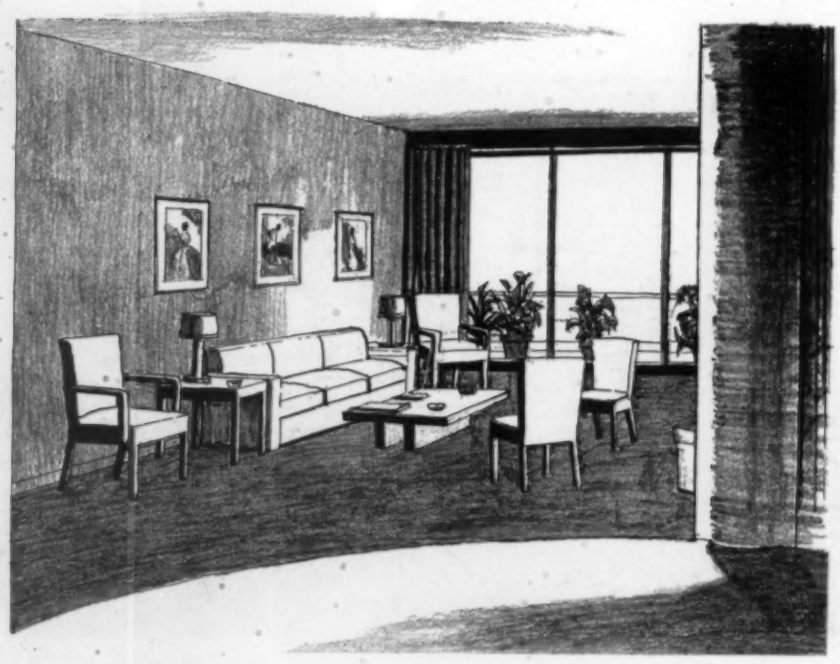
1. Under the laws of New York State and several other states in this country, private redevelopment companies and limited dividend corporations may receive the benefits of the power of condemnation and of partial tax exemption. For the pilot project, if a redevelopment company were to obtain tax exemption on the value of the improvement over and above the previously existing assessed valuation, the rental per room per month would be reduced from $26.14 to $20.83.

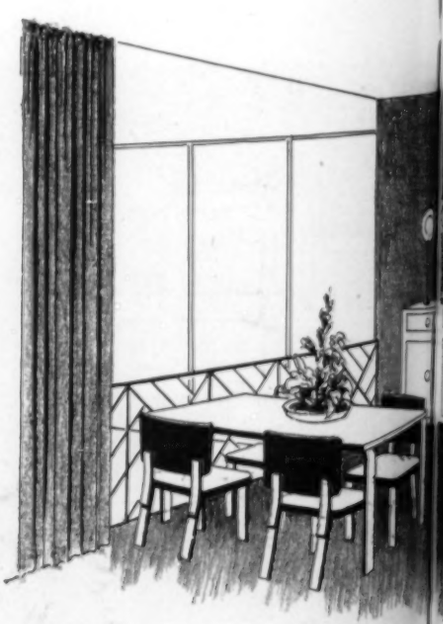
2. The debt service factor of 5.05 per cent per annum is based on an interest rate of 4 per cent and a 40-year period of amortization. It is obvious that housing of a type here described is to be considered as an investment and not a speculation. This approach, of course, would be attractive to insurance companies, limited dividend corporations, cooperatives, and others seeking sound investments in the field of housing. In fact, the low coverage shown in the pilot project, the advanced design of the unit plan, and the fireproof, reinforced concrete construction well justify an amortization period longer than 40 years, and perhaps even a reduction in the annual interest rate. If the interest rate were 3½ per cent for 45 years, it would result in a rental of $24.61 per room per month without tax exemption, and $19.30 per room with partial tax exemption. Existing statutes which provide financial assistance to private builders and to veterans, such as the FHA insurance provisions and the G. I. Bill of Rights, should be liberalized to cover the longer period of amortization warranted by this plan.

3. The rental shown for the pilot project reflects a fairly high land cost of $5.50 a sq. ft. This includes the cost of acquiring slum buildings which have to be demolished. If ways can be found to bring down the costs of such sites, the rental can be reduced by about 60 cents per room per month for each one-dollar saving per sq. ft. of land.

4. The density for the pilot project, considering only the area within the property line of each block, is 459 persons an acre, or 125 families. If the area of the open streets running through the project is included, as is customary in other large-scale developments, the density would be 397 persons an acre, or 108 families. Density, however, should not be considered apart from the building coverage of the site, the site plan as a whole and the recreational facilities — both outdoor and indoor — provided for the project. In light of all these factors, the density for this project is reasonable.

5. The development cost of $2,500.00 a room (excluding land) is predicated on actual bids received by the New York City Housing Authority for other projects, adjusted to cover the higher standards provided in the pilot project. When bids are received, however, on a project designed with the pentagonal plan, lower construction costs should result. Most of the mechanical services are confined within the central core. This applies to the boiler flue, electric risers, telephone risers, house tank, fire line stacks, ventilating equipment, slop sinks, incinerators, elevators and stairs. In addition to the economy resulting from the concentration of these services, further economies should result from the optimum use of basic facilities. For example, 12 self-service elevators, each with a speed of 500 ft. a minute, are provided to serve 1020 apartments (the first floors are omitted); this is about one-third fewer elevators than required on other private projects of comparable size now being constructed in New York City. The optimum use of facilities applies equally to stairs and incinerator stacks. Interior mechanically ventilated bathrooms will result in greater efficiency in ventilation





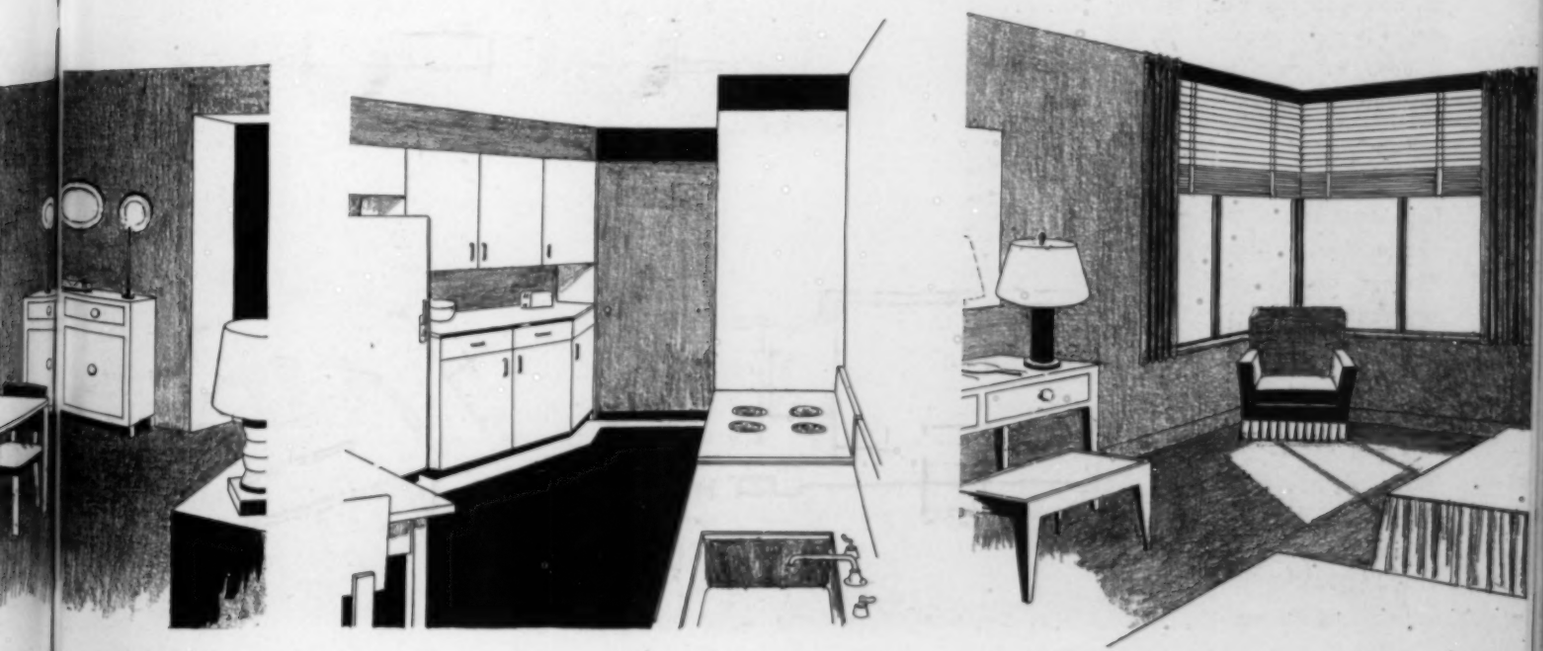
An attractive entrance can be provided on the first floor, right. Below: sketches, also by Floyd Yewell, showing respectively interior views of the living room, dining room, kitchen and a bedroom with a corner window

and location of bathroom equipment; it also results in a saving of 50,000 sq. ft. of exterior wall for the six buildings. Mechanical trades should also show a substantial saving under this plan. For example, with regard to heating, the perimeter which has to be heated is only 14.0 lineal feet per construction room. The buildings are also designed for reinforced concrete which, to date, has proved the most economical type of construction for multi-storied fireproof buildings.

6. Many of the factors in the pentagonal plan which lead to lower construction costs also result in lower management and maintenance costs. Fewer elevators, less public hall space, optimum use of slop sinks, incinerators, stairs, all require less maintenance. Heating costs should be lower because of smaller perimeter.

The concentration of the buildings, resulting in large open spaces and the retention of the existing street pattern, produces other possibilities of distinct economic advantage to the project. It would be feasible to construct underground garages in the open areas and still retain the use of those areas for playgrounds and sitting spaces. Furthermore, the site plan lends itself easily to a division of ownership of each of the buildings, if that should be desired for any special financial considerations.

The pentagonal plan demonstrates a modern and efficient design for replanning blighted areas in our city. Assuming any level of construction costs and competent financial plan for investment, the pentagonal plan should produce the most economical results.



DUPLEX APARTMENTS IN ECONOMY ROLE

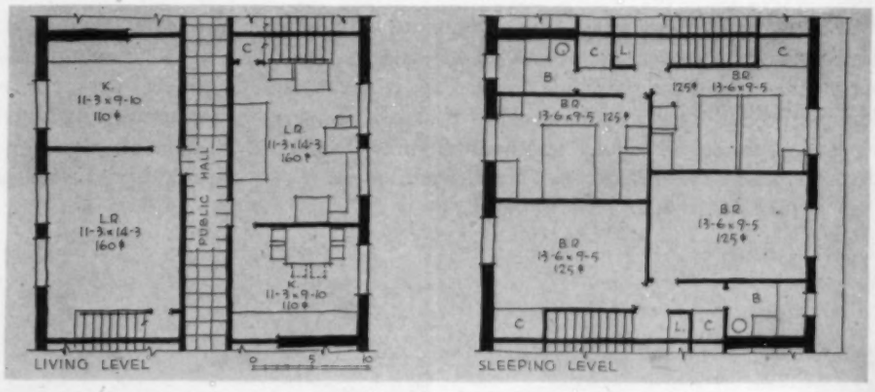
DUPLEX apartments, long familiar in luxury-level buildings, here appear in a new economy role. They are, in this scheme, applied to the multi-story, maximum-economy pattern of large public housing developments. The results indicate that the duplex apartment, originally cast as a wealthy wastrel, may succeed equally well in down-to-earth assignments where every square foot is counted.

The scheme is currently before the New York City Housing Authority, where bright ideas on planning are carefully, and often competitively, scrutinized. In fact the analysis here presented is a direct comparison with the pentagonal cogwheel scheme patented by Fellheimer, Wagner and Vollmer. The comparison was made at the request of the Housing Authority, for the pentagonal scheme used for Farragut Houses is the latest darling of the economy seekers.

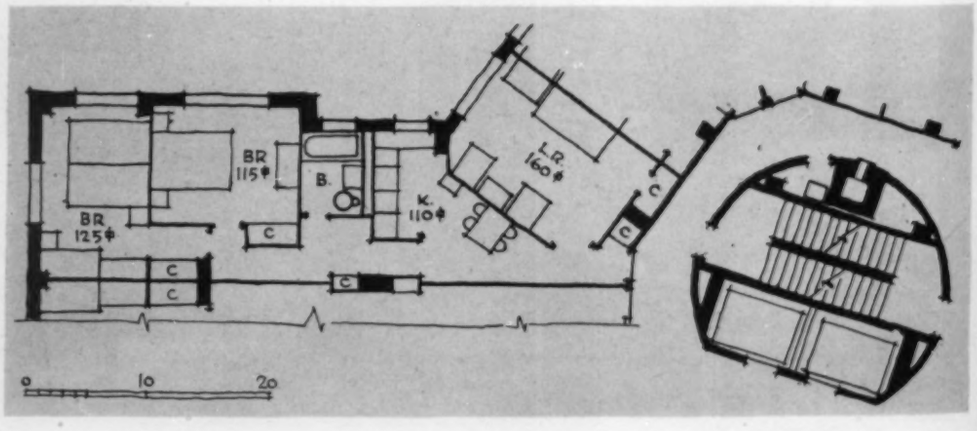
The duplex's basic claim to economy in the tall building is the saving in corridor space, which is completely eliminated on every other floor. Living quarters are laid in conventional rows paralleling the corridor on the "living level" floors. Bedrooms, on the floor above (or below), are put crosswise of the building, absorbing the space that corridors would normally occupy.

Evaluation of the space saving is not as simple as might appear at first glance. There is an almost total elimination of public space on every alternate floor — the elevators do not even stop there. Corridor space within the apartment is also reduced virtually to zero. Against these items there is the space required for interior stairs in each apartment, though this yields some by-benefits in closet space and an additional openness to the rooms. Also on the negative side is the fact that public corridors are longer than usual on the floors that must have them. The true measure of such items is not to be had in terms of individual apartment units, but only in complete buildings or groups.

The comparison with Farragut Houses (pentagonal plan) is in terms of the whole development of the Farragut site. Even in so broad a comparison there are



When the duplex scheme is applied to tall elevator buildings, no corridor is required on alternate floors, the bedrooms running through the wing. A balcony on bedroom floor serves as outside fire escape, satisfying New York City requirements for a second exit. There are virtually no interior corridors; cross ventilation is good; interior stairs (not included in area figures) add spaciousness and closet space



The much-discussed scheme by Fellheimer, Wagner and Vollmer, architects (see new version, pp. 80-85), uses a pentagonal cogwheel plan, confines public corridor to central core, leaves long interior halls. The scheme is protected (Copyright No. 36922, Nov. 13, 1945); is a current economy favorite

Architects Harvey Wiley Corbett and Charles H. Sacks Adapt the Duplex to Elevator Apartment Buildings and Show Both Space and Dollar Savings

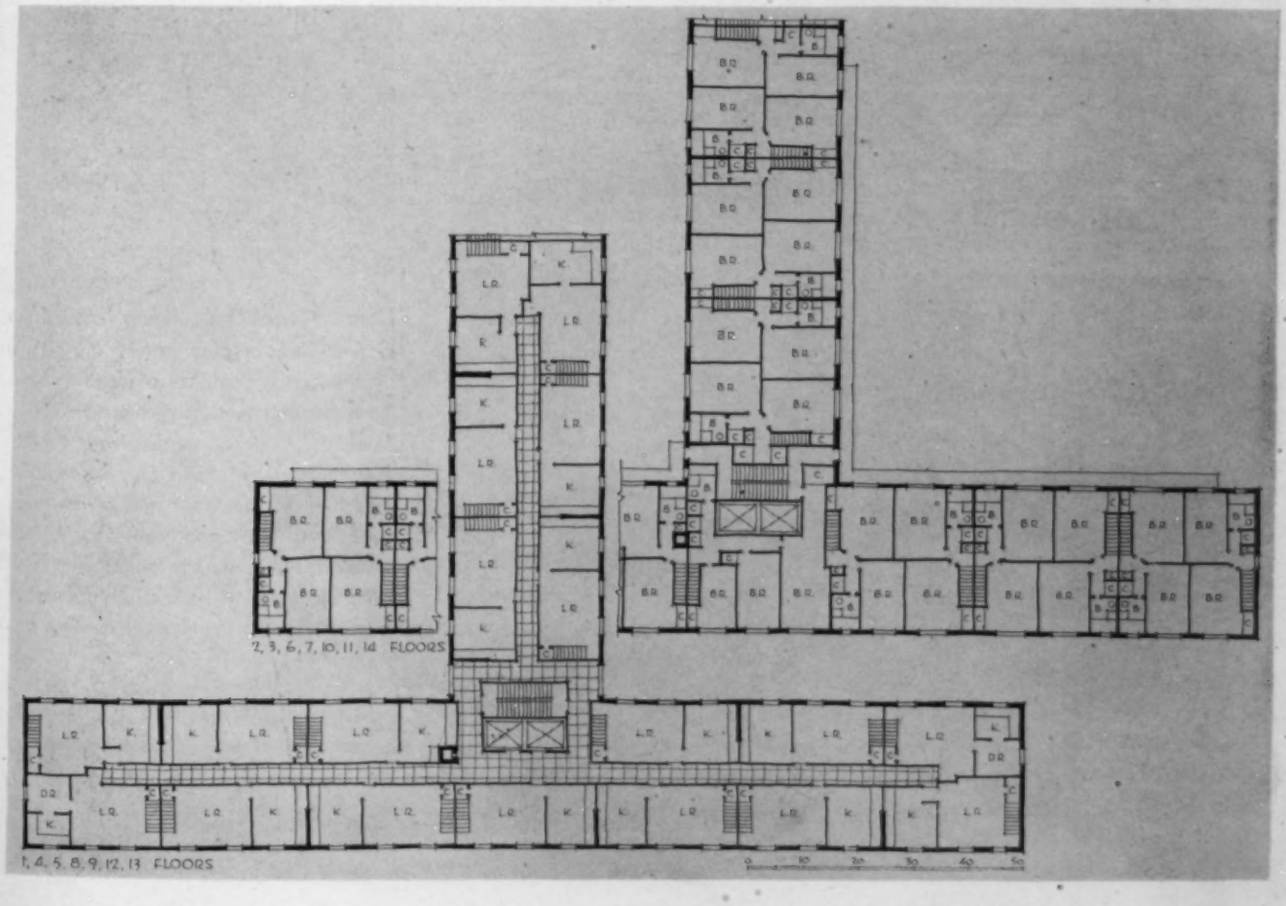
bound to be some distortions of principles applied to specific requirements. In this way, the Corbett-Sacks duplex scheme was modified to include some simplex floors in order to provide a higher proportion of very small units; also the elevator scheme was changed to make a more direct comparison.

But the Corbett-Sacks analysis shows advantages for the duplex scheme: (1) smaller land coverage; (2) a gain of 242 rentable rooms; (3) a saving in total cubage. The table (page 88) seems to indicate smaller "Average Room Area," but it is pointed out that the sizes of actual rooms are really larger, because the corridors of the pentagonal plan are included in the rentable area used in figuring the "Average Room Area." The interior corridors are practically eliminated in the Corbett-Sacks scheme.

One competitive point seems difficult to resolve. The pentagonal scheme was widely acclaimed for achieving a figure for brick-wall-per-room of only 13.3 ft. The Corbett-Sacks figures, based on the whole Farragut development, indicate 14.36 ft. for Farragut; 13.6 for their own scheme. Leaving the protagonists to settle their own methods of figuring, it is safe to say that both schemes are remarkably good in this respect.

The duplex scheme has other points not included in area comparisons. Elevators stop only at alternate floors; there is a considerable saving in door openings and control devices, estimated at $600 per stop. Also since elevators need not stop at the top floor, there is a saving in penthouse structure by using the top of the shaft above the last stop. However, the duplex plan for the Farragut site calls for two more elevators (the Authority turned down a cross-over scheme which might have saved a number of elevators); the net saving claimed for the duplex scheme is estimated at some $30,000 for elevators and bulkheads. The duplex scheme is penalized heavily by the added cost of stairs and the balconies which are used as outside, horizontal fire escapes.

The duplex scheme gives excellent cross ventilation,



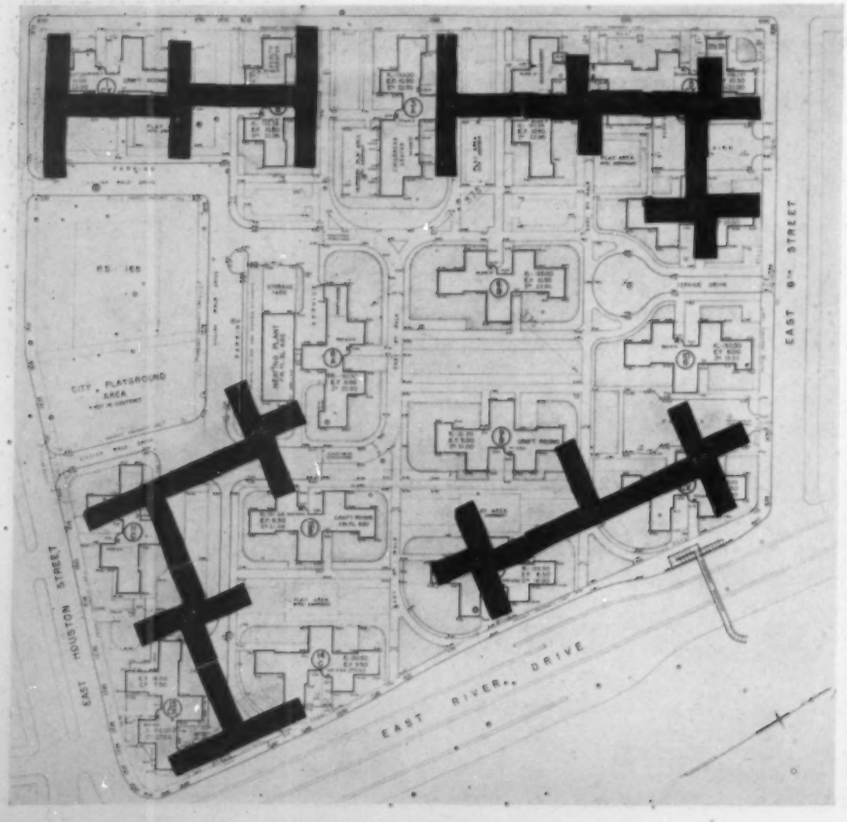
	FARRAGUT HOUSES (PENTAGONAL PLAN)	DUPLEX SCHEME FOR SAME SITE
Land Coverage	88,440 sq. ft.	84,568 sq. ft.
Total No. Apartments	1,400	1,442
Total "Construction Rooms"	5,600	5,960
Total No. Half-rooms	278	42
Cubage (Full Cellar)	11,410,000 cu. ft.	10,876,382 cu. ft.
Persons Housed	5,334	5,537
Residential Area	1,238,202 sq. ft.	1,183,996 sq. ft.
Cube per Room	1,984 cu. ft.	1,818 cu. ft.
Cube per Person	2,139 cu. ft.	1,964 cu. ft.
Average Room Area	216 sq. ft.	198 sq. ft.

In this statistical comparison room areas are perhaps overly statistical; "average room area" is simply total "residential area" divided by number of rooms. Actual areas on plans compare more closely. Otherwise the table demonstrates important economies claimed for the duplex

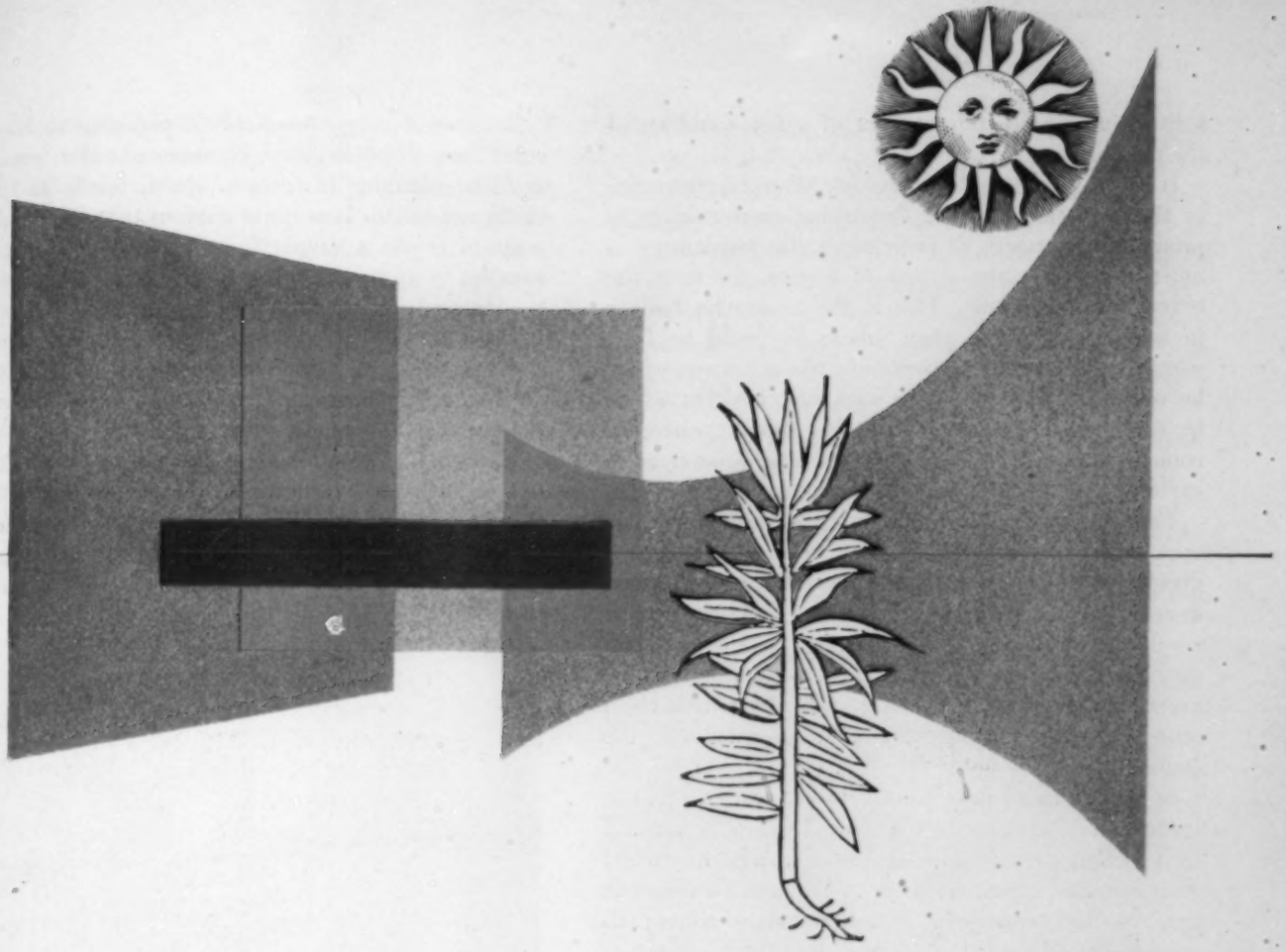
since bedrooms go through the wing. More important still, it gives good sound isolation between apartments. Living rooms are on different levels in adjacent units. The protection up and down is still greater. Levels are reversed vertically, so that a bedroom level is never directly under or over a living level of a neighbor's apartment — two living levels, then two bedroom levels.

Other economies might come from the duplex scheme. For example, its buildings run to long symmetrical patterns, without many corners or non-typical shapes or queer column patterns. They should naturally be economical in construction cost; would be especially suitable to prefabrication or precast slab devices.

In a cost comparison Corbett and Sacks have been able to claim an overall saving over Farragut of 12.9 per cent. The detailed calculations are not here included, since the Authority has not yet given an opinion on the scheme or on the cost comparisons, nor has there been an opportunity for rebuttal. There is, nevertheless, obviously ample ground for the assertion of Corbett and Sacks that their proposals have indicated new possibilities for the duplex unit in the battle against costs.



Here the two major building forms of the Corbett-Sacks duplex scheme are shown overlaid on a site plan of another New York Housing Authority project — Lillian Wald Houses. The duplex lends itself to long narrow dispositions, leaving the center of the plot clear and giving good outlooks to each apartment unit. Interior streets may be kept to a minimum, and all buildings may be serviced from peripheral streets; utilities concentrated



HOUSES

ARCHITECTURAL RECORD'S BUILDING TYPES STUDY

NUMBER 131

PLANNING THE CONTEMPORARY HOUSE

By Alden B. Dow

THE more closely we examine all things about us, the more obvious it becomes that the law of nature is to create, to grow. Man is a part of this law, and grow he must, for it is the will of the universe.

Today this man travels on the earth at 400 miles an hour. He flies through the sky as fast as sound. But he is still an individual, searching for growth.

The machines he has developed are amazing tools. But he will not be able to use them until he really finds a place for them in his growth as an individual.

These machines of travel are not unlike his buildings; in fact, his buildings have been called "machines for living." There is a device that controls the light; another, the temperature. By the push of a button, gongs ring and music plays. With a twist of a crank, the man opens a can to eat; the contents give him energy to push more buttons and travel at still faster speeds.

But where is he as a growing individual? He is swamped in a sea of machines, and with it all he is bitterly unhappy.

Of course these machines represent the growth of certain highly developed individuals, but we have failed to use them for developing individuals in general. This will eventually come about in a natural way, but

a little intelligence on the part of a few could speed the process.

It seems to me that the destiny of architecture lies in this direction, that of developing surroundings to promote the growth of individuals. Its importance is most obvious in the design of houses, for here the individual is supreme. This is the reason he built a house. He wanted a place where he could be free; where in the bathtub he could sing like a Caruso; where he could romp on the floor with his children; where he could change things to suit his fancies; where he could tinker with ideas that no one else believes in — in short, a place where he could develop as an individual.

Today too much of our housing is not taking this approach, it is regarded merely as shelter. The individual is looked upon as one of the herd; his individual development is a matter of mass organization. As a result, the growth of such pacifiers as beer parlors, dance halls, organized games, mass this and mass that, are developing at a rapid rate, and along with them more and more discontent and more patients in the sanitariums.

Some say that many people do not want to live as individuals. This may be true, but it should be realized that such people are not contributing to a healthy world and something must be done to stimulate a desire in them to live and grow as individuals — individuals possessing undreamed of possibilities. When we realize this and set the development of these possibilities as our goal, we shall see a heaven on earth, a renaissance of the human being.

Style in all its forms is a great hindrance to this development. It is commercialized individualism. It is little more than keeping up with the Jones's, and worrying about what the Jones's think makes it difficult to grow. Rather than this point of view, we should worry about not hurting the Jones's, and growing all we can ourselves in every way possible. That is honest, healthy living, and it is the only way that we, as individuals, can truly grow, and in turn the only way civilization can develop. Like all things about us, it is organic living; one part belongs to another part.

As architects we practice that which should become the greatest profession. A greatness made not of power, but of growing human beings. We represent the greatest of the humanities because we embody them all.

Now how do we apply this to building and to houses in particular? Briefly, we aim to make every house reflect and initiate the activities of the humans living in them.

Today, architecture is started on this course, but so far it is concerned with little more than the most elementary basic planning. We worry about how to manage the automobile efficiently in and out of the garage; how to enter the house from the garage; the arrangement of rooms accessible from this main entrance; the number of footsteps we take in running the household. We try to feature the outside views, but aside from these points everything else is pretty much a matter of style and the individual's development is forgotten.

We should carry this kind of planning to its true conclusion which involves planning in color; planning in form; planning in texture, space, touch, and even smell and sound. It is quite obvious that the resultant solution is not a simple form, but, on the contrary, complex — and well it may be, for it is to be used by the most complex organism known, and that is *man*.

All of these phases of planning involve the physical well-being of the individuals living in the house and are in no way concerned with style. In other words, they involve facts, or science.

Beyond these facts lies the knowledge called "Art," without which the form is cold and forbidding. Without this "Art," the form lacks that last touch that links it with the life of the universe — that quality of inspiring others — that path upon which emotions develop.

"When houses reflect and initiate the activities of the humans living in them, they are homes."

The kind of knowledge that produces this effect we call "intuitive," and here I wonder if we are not forgetting something in our schools: intuitive knowledge and its development is completely ignored. And yet, regardless of profession or work, it is this intuitive knowledge that finally determines the individual's true value in society. It is the knowledge that is always leading the way — simply because it is exploring that knowledge beyond consciousness.

Let me cite an example. Some time ago I was in Mexico. I called on an architect and visited some of his work. I was amazed to find that he was using only pastel colors. I told him that I had always heard about the bright colors in Mexico, and it was a shock to find him using these delicate tones. His reply was, "Oh, bright colors — that's only Indian stuff."

Actually, as so often happens, he was letting prejudice rule his intuitions. Again style was the villain. The Indians were honest as is usually the case with primitive

peoples and children. Only developed societies become confused with that insidious thing called "Style."

Let us cease attaching names like gothic, colonial and modern to our work, and concern ourselves only with the building of structures that reflect honest, human living to its highest degree. That is the way Nature, in her own medium, expresses herself, and we do not have to look far to see the wonders she has wrought. Wonders that are perhaps too great to appreciate, but yet not too great to see and feel. We should study these wonders and learn to understand them, for as long as we explore and adhere to Nature's ways, we will develop as people, as individuals, as society, and our architecture will be not only beautiful and reasonable, but also a way of life. The contemporary house, if it is to live and grow and become a home, must do this. A healthy way of life can never be accomplished through regimentation, and this alone spells the doom of regimented housing.

True enough, housing today presents a gigantic problem, but civilization is faced with many gigantic problems and this one is for architects to solve.

We must simplify our building methods. We must develop building units that can be put together by inexperienced hands. These units should be small enough to allow for all kinds of flexibility. They should be as thin and as light as possible and should be made of materials that can be cut with a saw so that individualized conditions can be met. All parts of the building should fit into the system, including kitchen, laundry plant and bathroom. These latter items should be available as completed units, with assembly connections so simple that a child could make them.

With such facilities it no longer will be necessary to hire an experienced estimator to give only an approximate cost of the finished building, for the number of units required can be counted easily by anyone, and the total gives the cost.

In addition to improved building methods, we should set up tax laws that not only encourage improvement and upkeep of buildings, but practically force them. It seems to me that this could be handled easily by reducing income taxes on a basis of property valuation, provided the reduction in taxes is used for improvements or upkeep of the property. For example: if your property were valued at $5000, you could use, say, 10 per cent of that, or $500, each year to improve or repair your house and deduct that amount from your income taxes. I can imagine no better way of bringing the growing rundown sections of our communities back to life, and at the same time producing happy and busy individuals.

Yes, there is a lot of work to be done, but the possibilities are tremendously exciting.

As a starting point in Michigan, we are calling on every architect to design a house for himself and his family, to be erected wherever he pleases, and built in any way he pleases, but the results must be those of inspired and growing individuals. The architect may build much of it himself, for the cost is not to exceed $6000. In view of building prices today, we know this requires ingenuity, particularly for the architect with a large family, but we know also that architects are made of stuff sufficient to meet such a challenge, as a rule, and come up smiling.

The proposed designs are to be presented in sketch form. In March we are planning to hold a show in Detroit, and later in other towns that are interested, exhibiting these dream houses. We intend this as a means of showing individuals some of the potentialities of architecture and living.

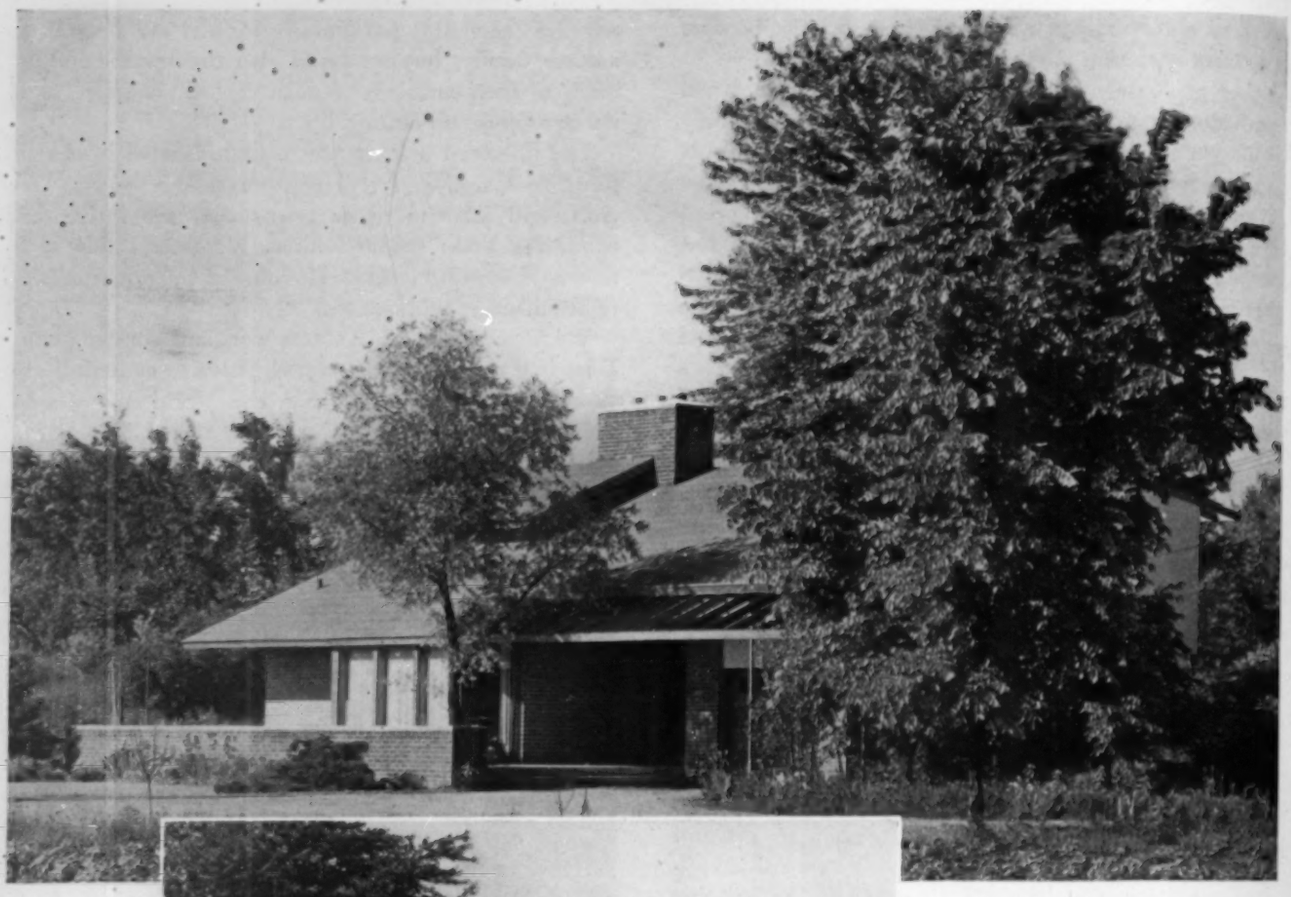
We hope to see other states work out similar plans. Here is a real way for every architect to contribute to the greatest problem facing the world today, the problem of furnishing soil in which the individual can take root.

Some may say that this all sounds like a beautiful dream, and, in the face of the work before us today, both physically and economically impossible. To that we can say that nothing is impossible that involves the health and welfare of civilization. To the architects, it should be the greatest challenge that has ever faced them. It is a challenge that involves not only the profession, but the whole human race.

"Not style but human aspirations form our architecture."
The author's office adjoins his house at Midland, Mich.

In the nature around us we find healthy cells combining to form trees and flowers that are a pleasure to look upon. But when these cells are unhealthy, it is reflected in the overall form. Human nature is little different. If we cultivate healthy cells or individuals, the overall form is a happy and beautiful thing.

Let us not forget, however, that the reverse is true. Confining individual growth will also confine the overall growth. Neither should we forget that the law of the universe is growth for all, so that growth of the human individual will eventually, naturally, come about. Let us not resist the way of this law!

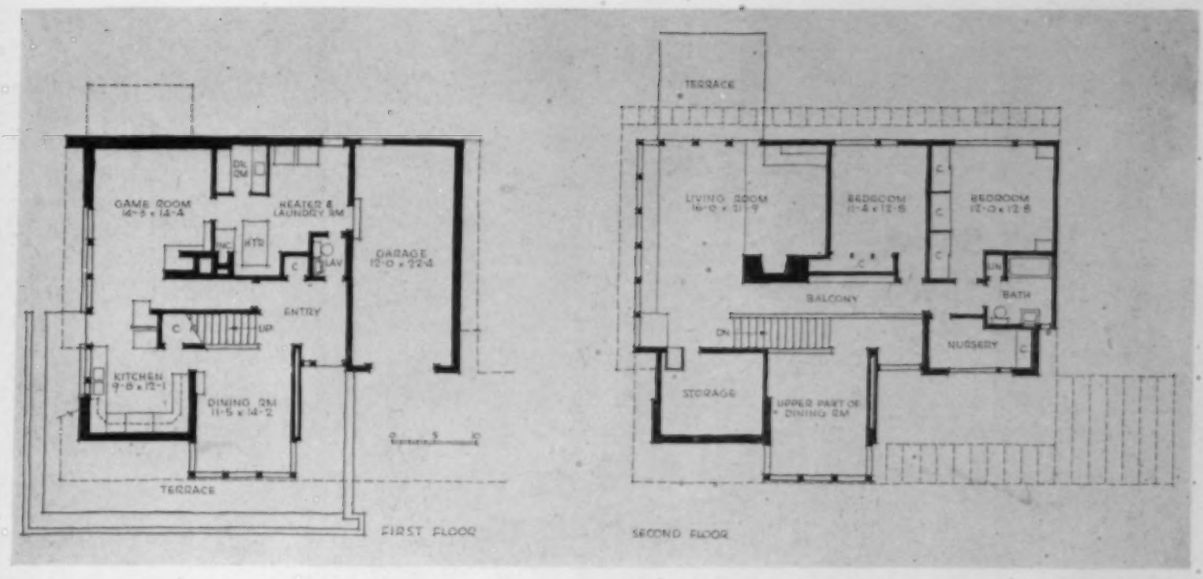


Elmer Astleford Photos

LIVING AT NEW LEVELS

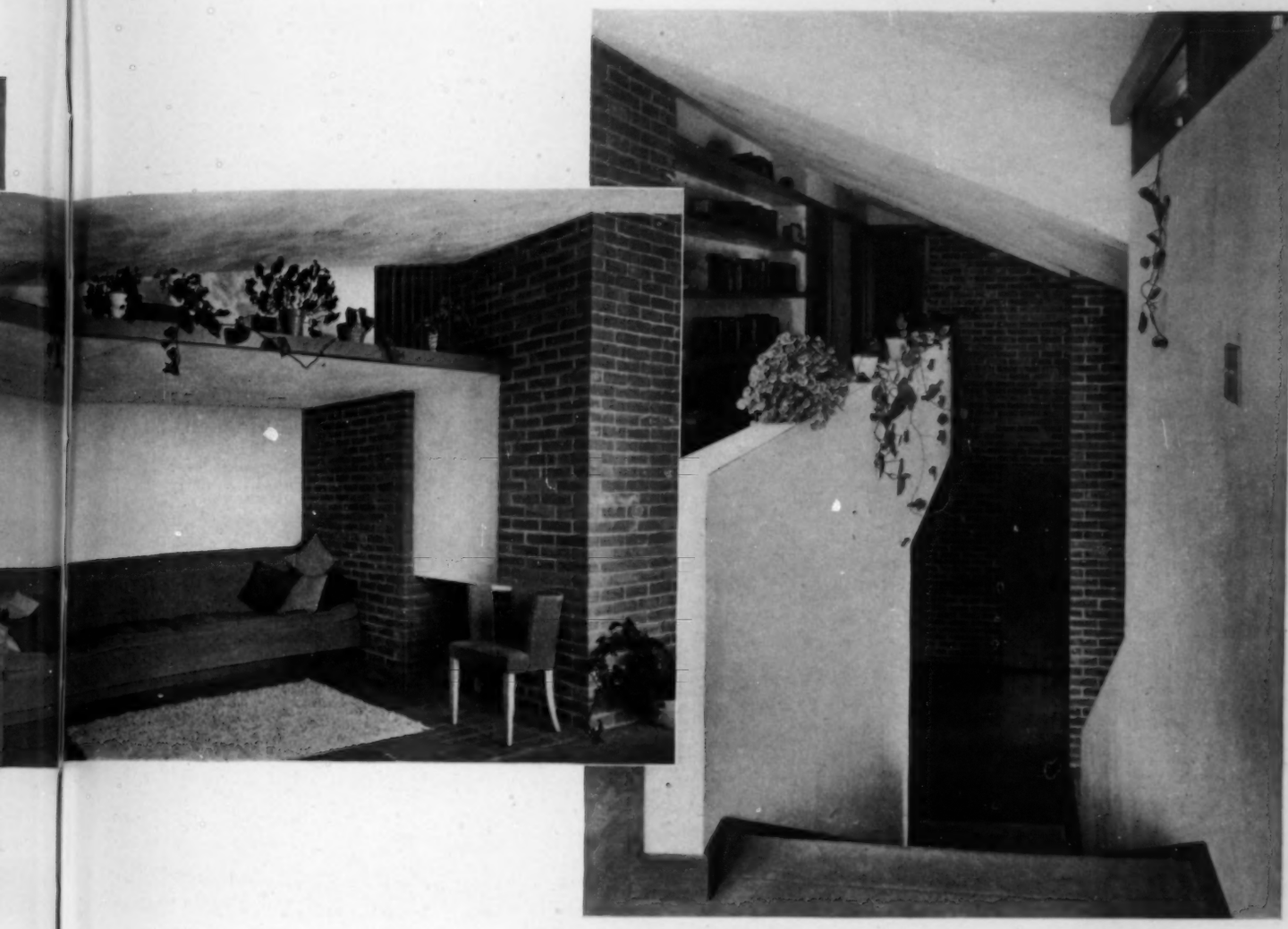
Alden B. Dow, Architect

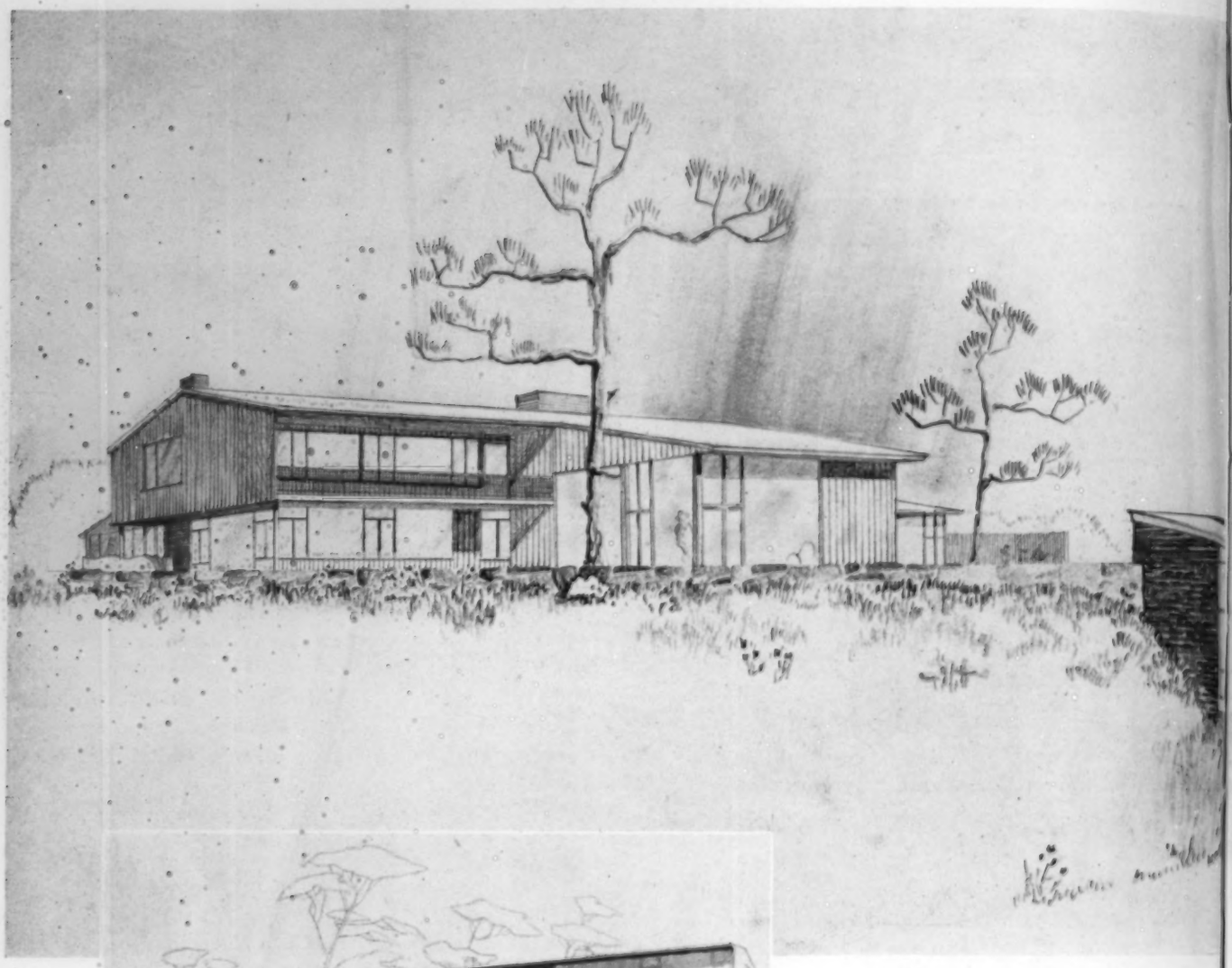
THE sloping expanse of roof, broken by the entrance trellis, combined with warm brick of wall and terrace, invite one at the entrance of the Don D. Irish house, Midland, Michigan. The roof break and the massive chimney give a hint of surprises awaiting beyond the door. From the entry one feels the spaciousness above the dining room and the stairs lead at once to the upper level living room with its great expanse of view. Ascent to this region gives almost the exhilaration of rising to a mountain top, and the view back from the balcony over the dining room, right, intensifies this impression. Such stimulus to good spirits is characteristic of this architect's credo in action (see pages 89–91), and the plan shows it can be accomplished with compactness and spatial economy.

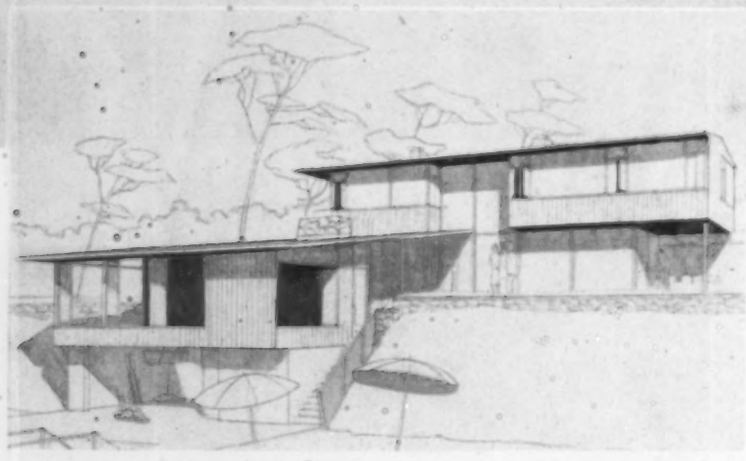


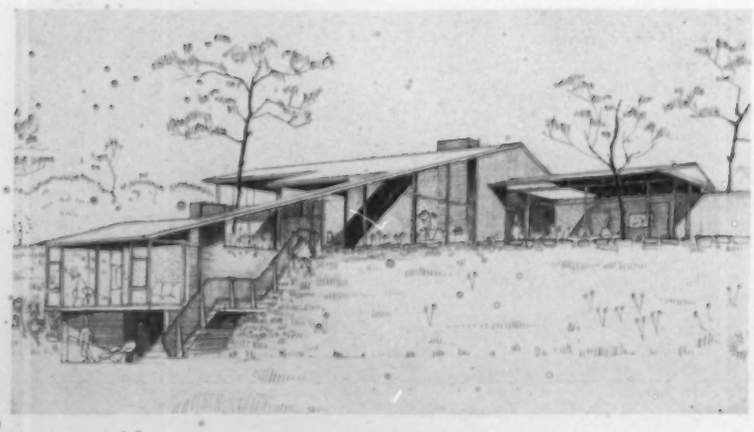
Above: the plans show how the spacious living room and the quiet bedrooms are given the advantage of view, light, and air of the upper story. The noisier activities are confined to the lower story for the kitchen, laundry, game room, dining room and garage are all on this first floor. The kitchen is accessible both to the dining room and the game room. Off the heater and laundry room is a well-equipped dark room for the photographic hobbyist

The living room has the bright serenity of a lofty summit, and the fireplace area gives a feeling of quiet seclusion as thoroughly as any mountain retreat. Photo at lower right shows the convenient association of kitchen and game room, but fails to convey the actual visual effectiveness of division between these areas by use of the plywood spur partition. All large interior panels are standard plywood; other woodwork is edge-grain fir. Plaster throughout is sand-float finish. Lower floors, except in dining room, are asphalt tile; dining room, stairs and upper floor are carpeted

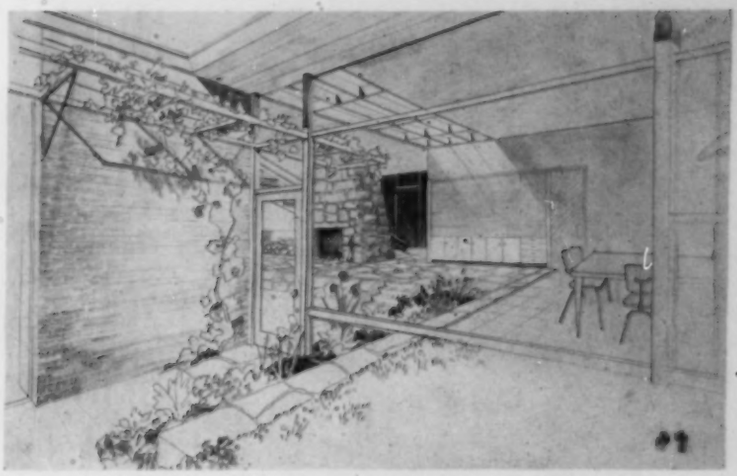


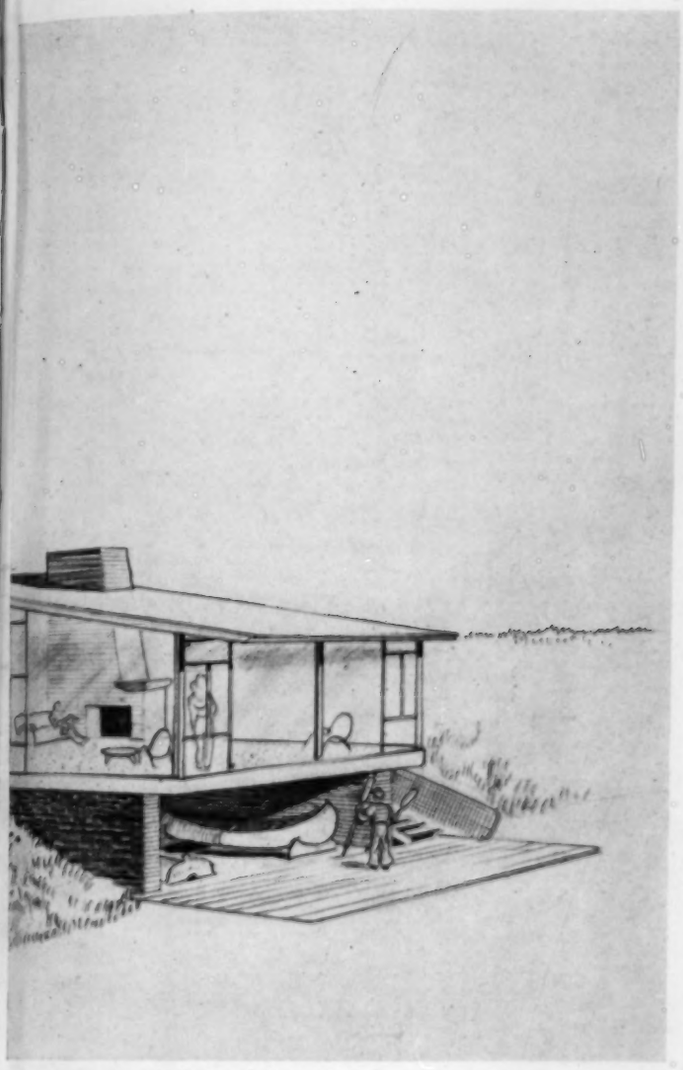






Rendering above (with a few discrepancies to be noted between it and the final plan) shows more or less the approved design. Earlier stages in the development (left) show a connecting roof between boat house and main house. This, the landowners association ruled, would obstruct neighbors' views of Nantucket Sound and had to be eliminated, with some consequent sacrifice of design unity. The clients requested that materials include board batten and brick on the exterior, plastered ceilings, and some brick and paneling inside





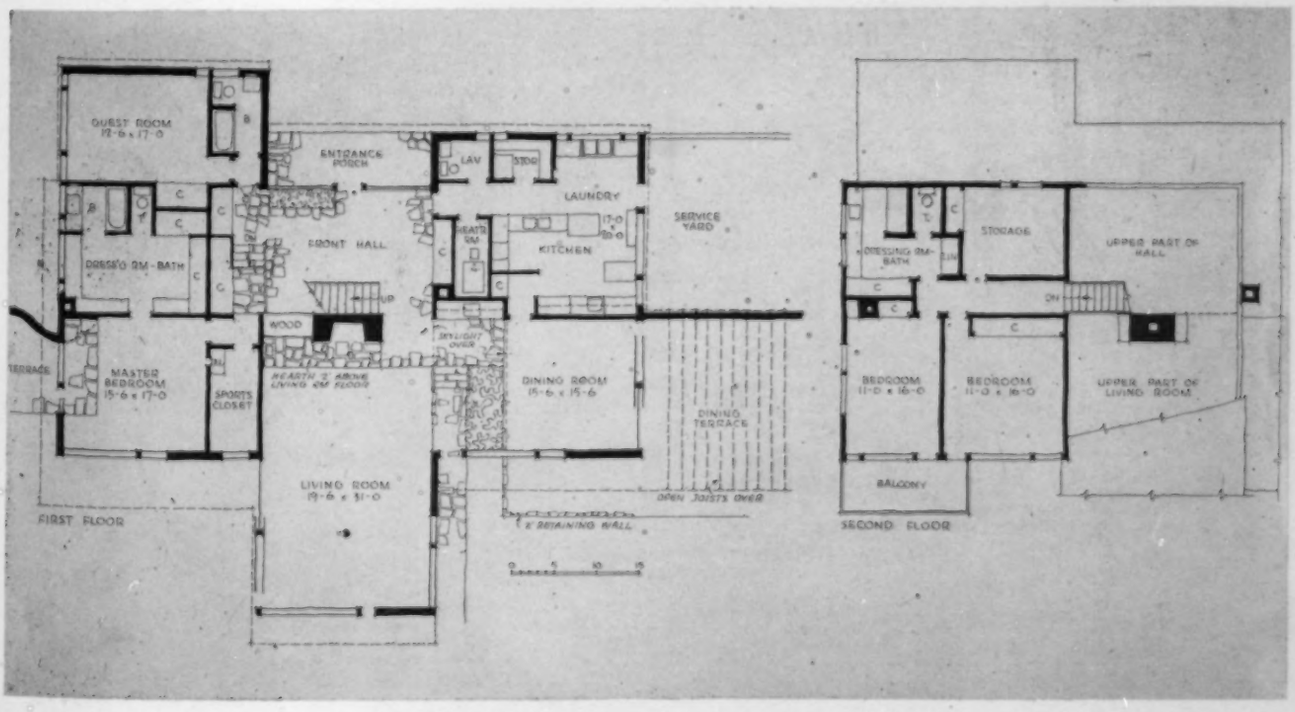
CAPE COD IN SITE ONLY

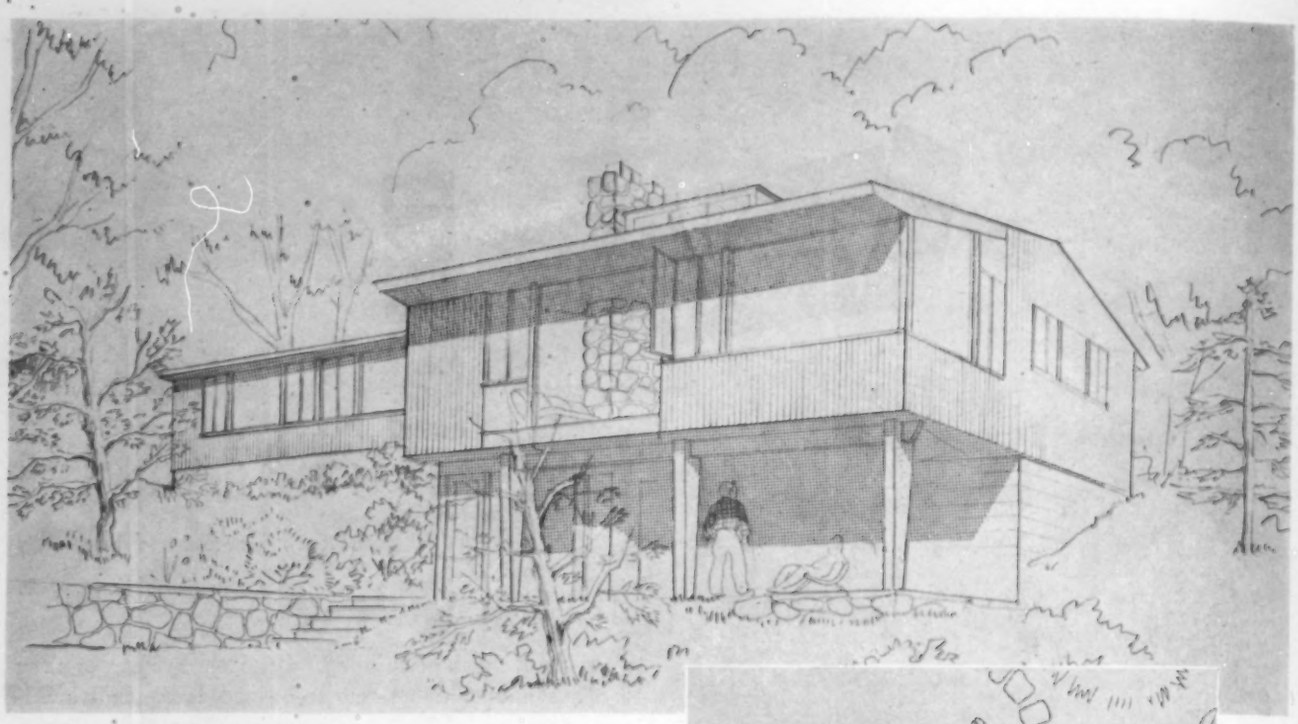
Carl Koch Architect and Associates,

Frederick L. Day, Jr.

IN MAKING much of a Cape Cod site, the architects have also managed effectively to by-pass local traditionalism. With no inhibiting stipulations from their clients, the only real obstacle came from a ruling by the landowners' association (see caption, page across). The site, at Oyster Harbor, has a view across the Seapuit River to Nantucket Sound.

Although designed primarily for summer use by the T. W. Estes family, the house will be fully treated for year-around occupancy. Space requirements, in addition to those indicated in the plan, were a two-car garage with servants' quarters, and the combined boat and recreation house shown in the renderings.

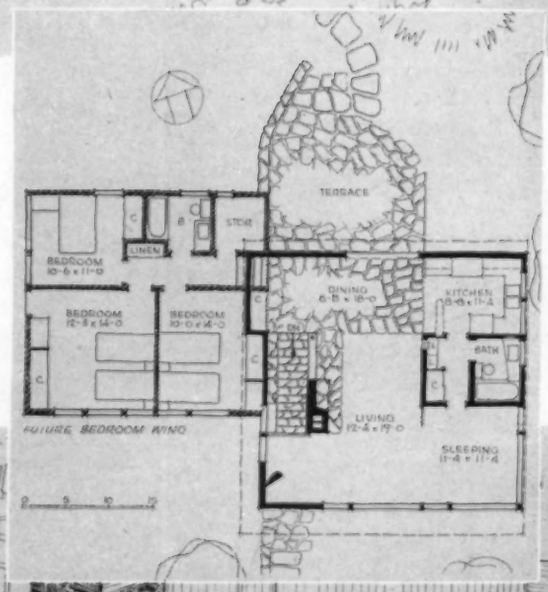


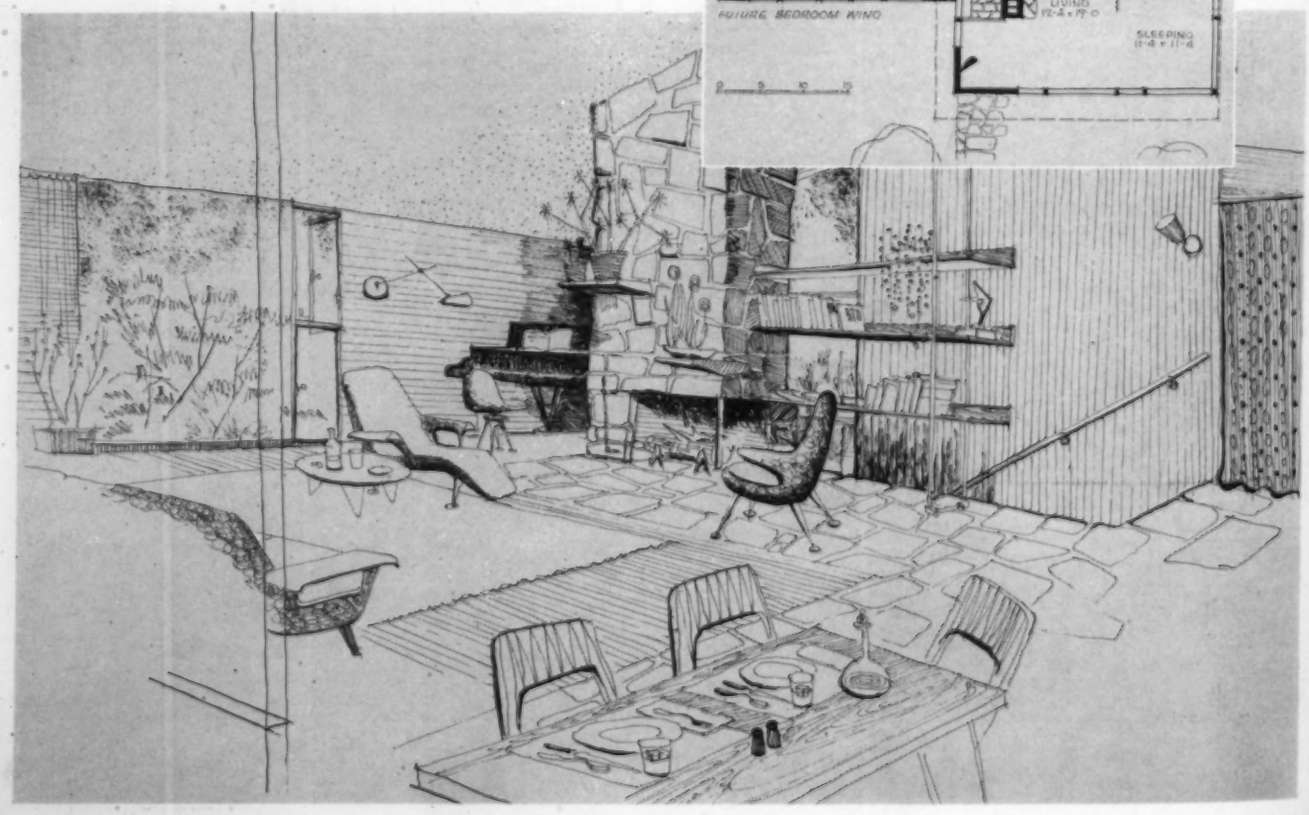


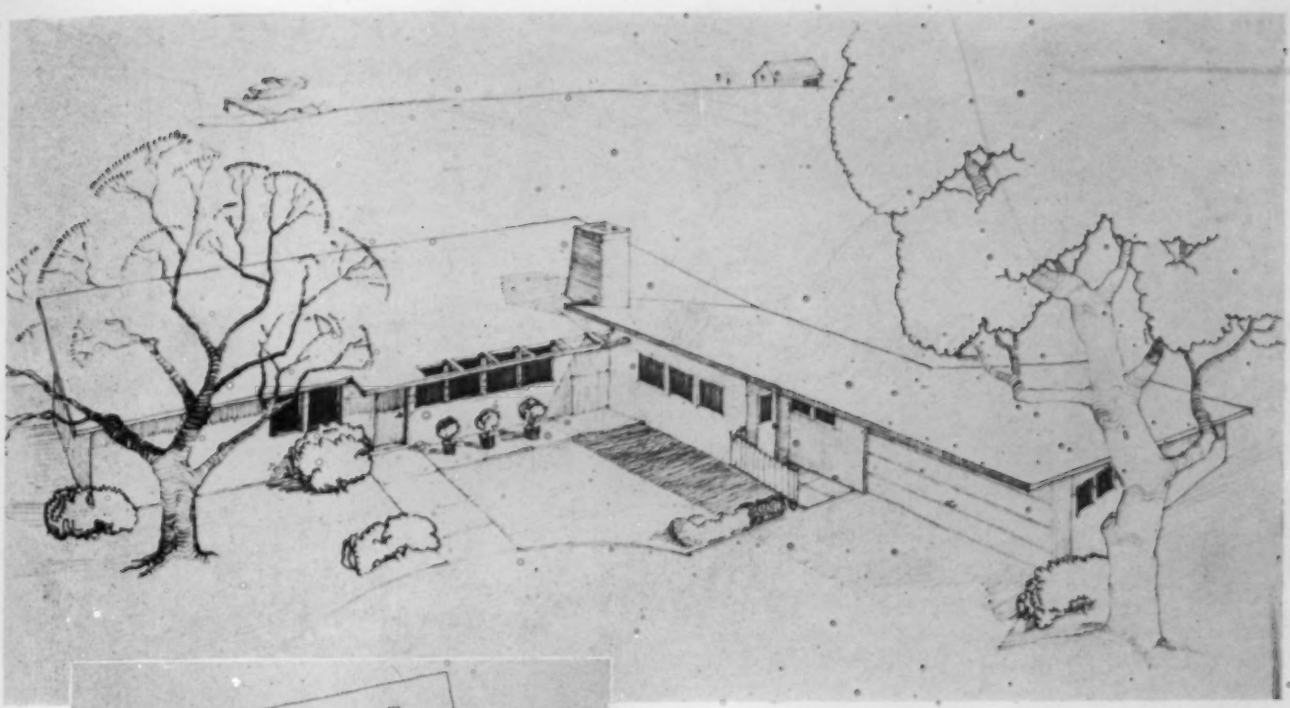
MINIMUM FOR EXPANSION

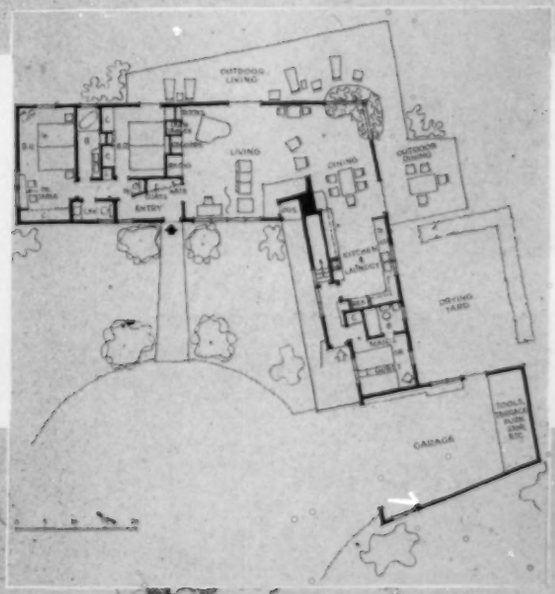
Carl Koch Architect and Associates, John Leon Lipshutz

A MINIMUM plan for the present, permitting future expansion, was required by Mr. & Mrs. R. V. Pound, Arlington, Mass. High placement and arrangement gives privacy to southern exposures. Clerestory admits sunlight to dining area. Lower level contains heating, storage.





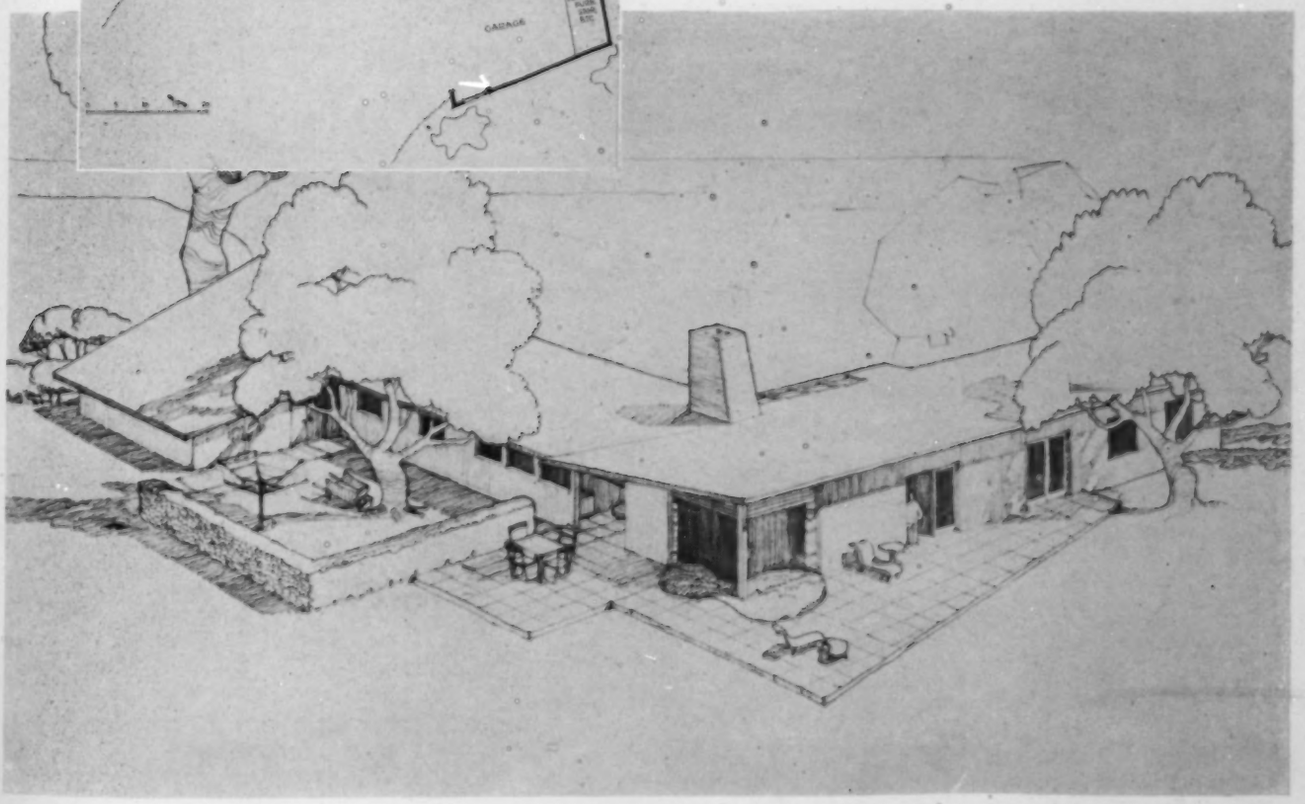


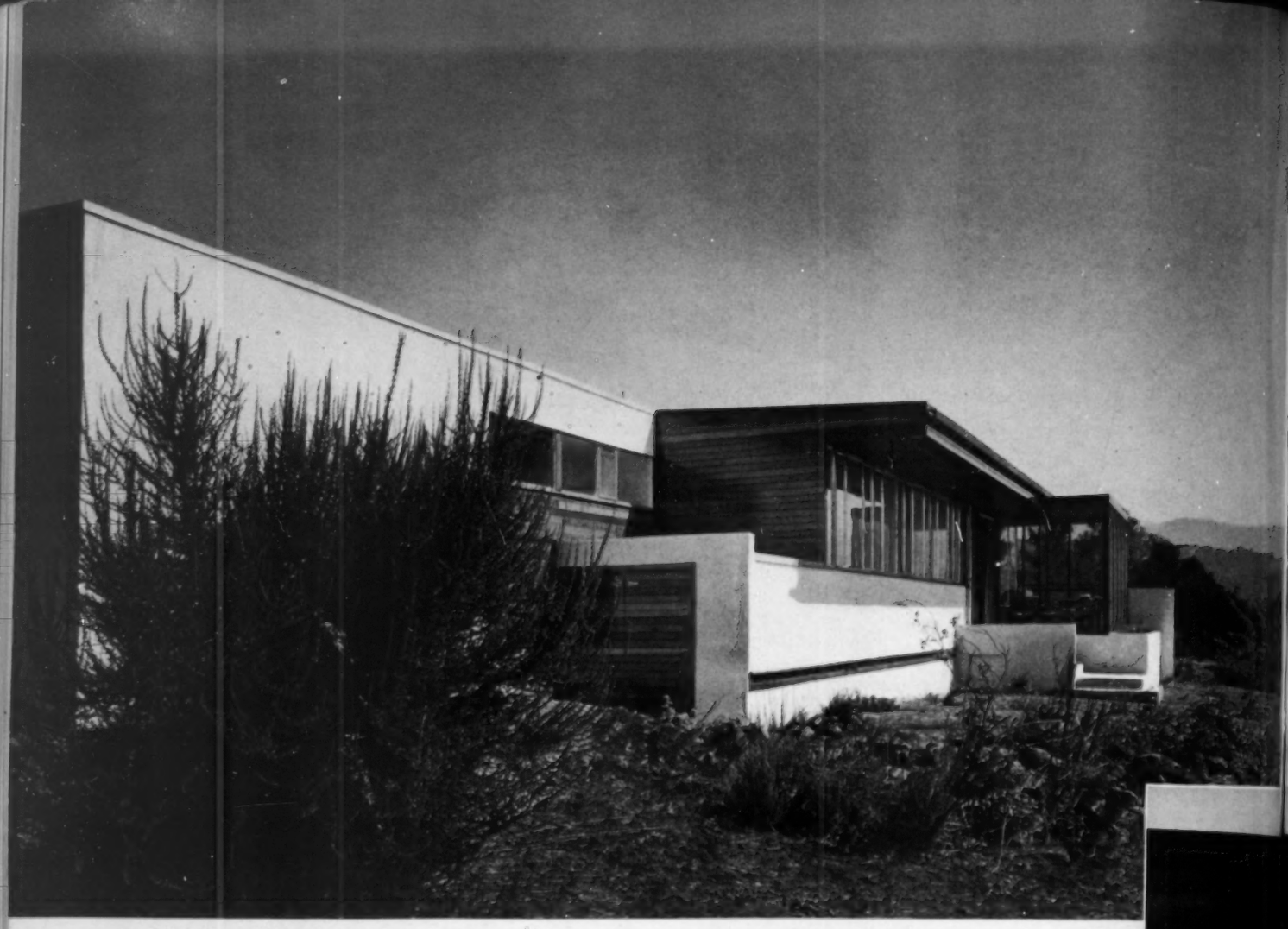


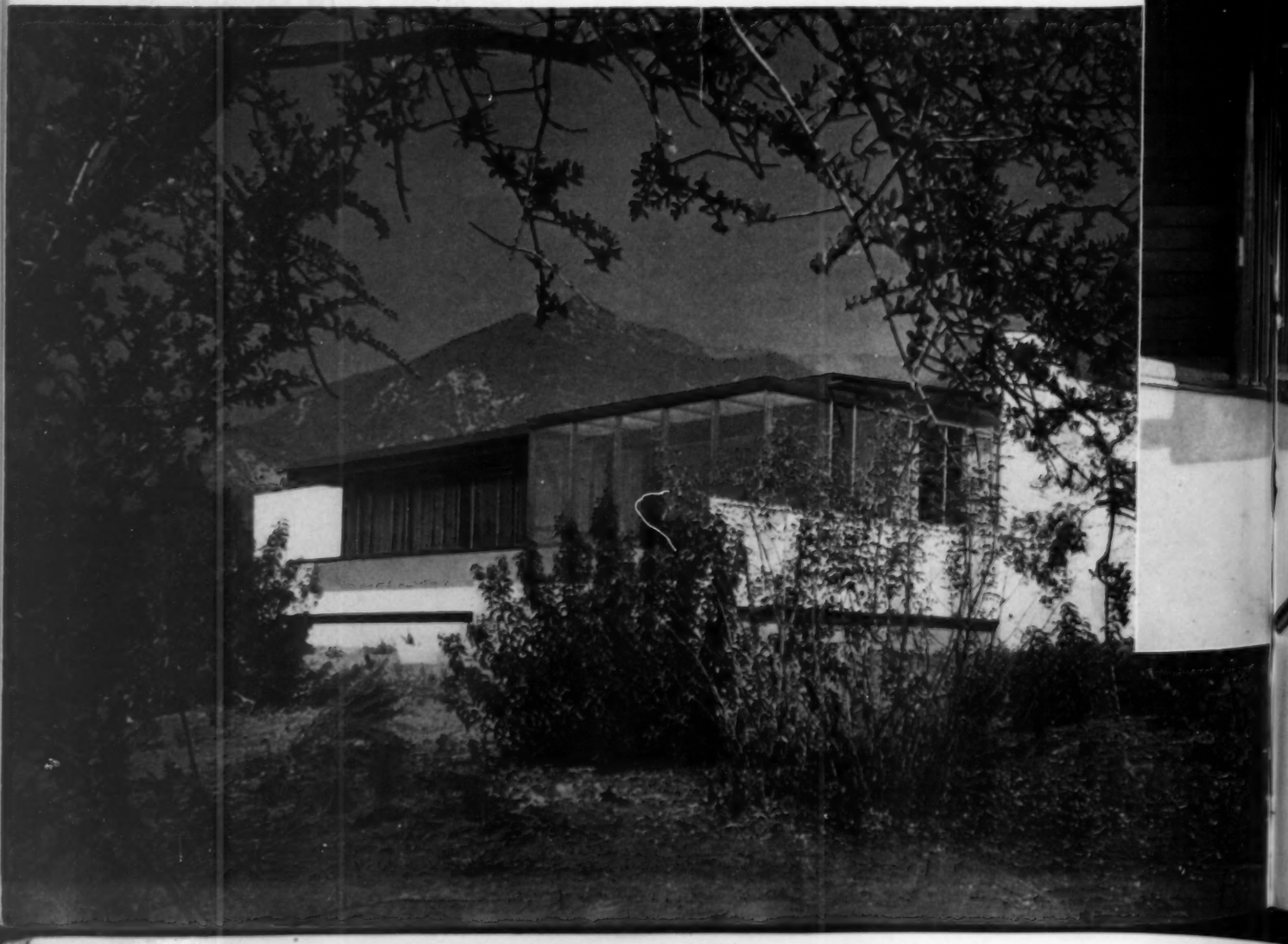
FOR EXTREMES OF CLIMATE

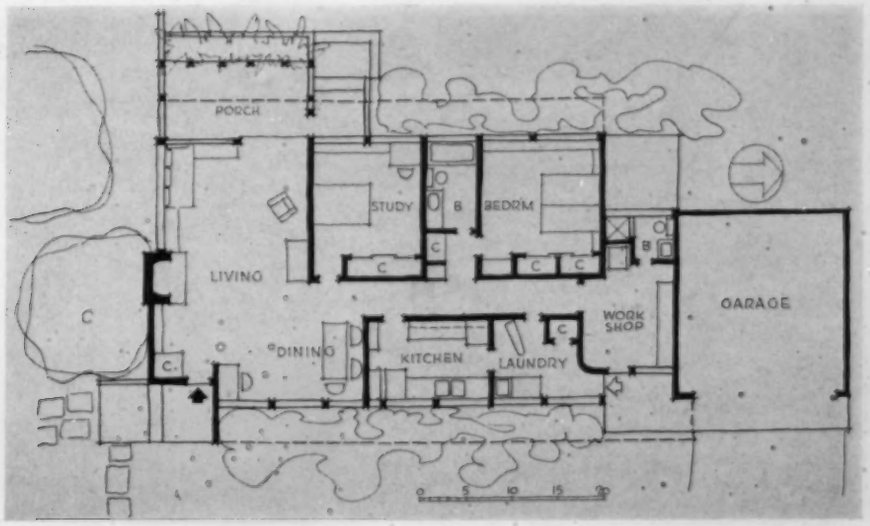
Sherwood, Mills & Smith, Architects

BLUSTERY winters in Cazenovia, N. Y., call for restricted fenestration and short drive and entrance walks, with heating coils beneath; summer conditions require provisions for open-air living. House is for childless couple who like large dinner parties.



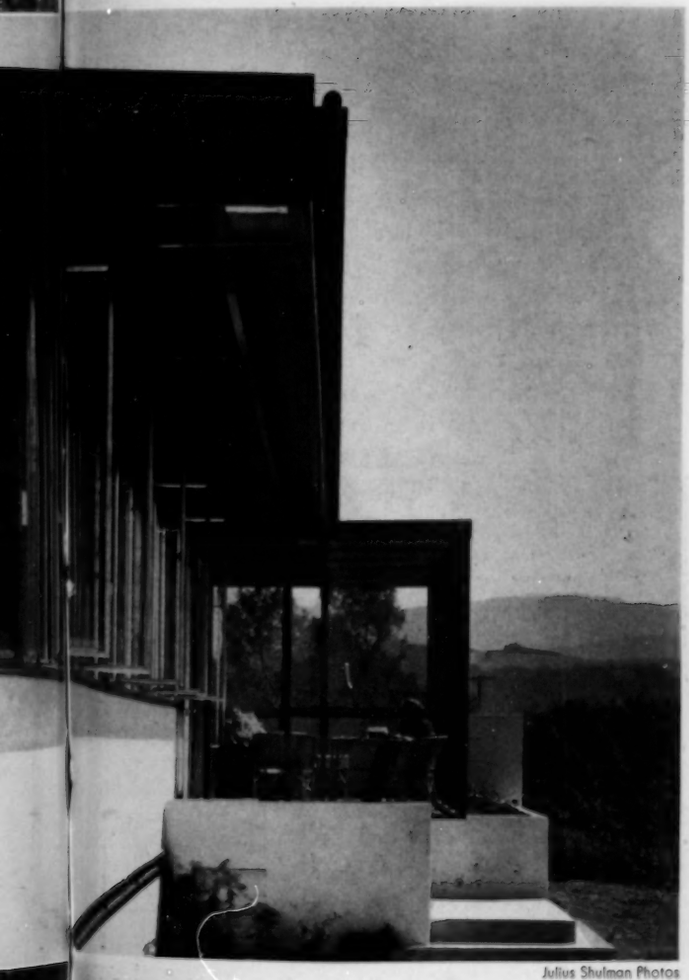






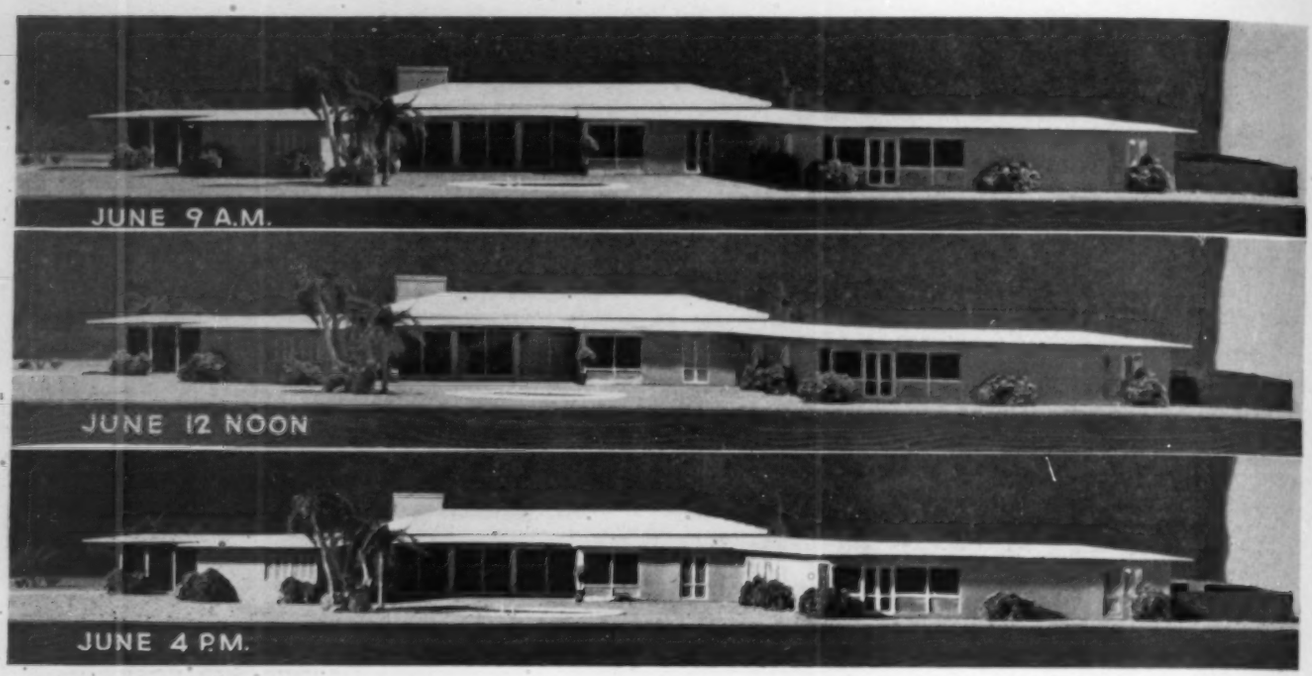
A NEUTRA HOUSE WITH SOME NEW TOUCHES

Richard J. Neutra, Architect



Julius Shulman Photos

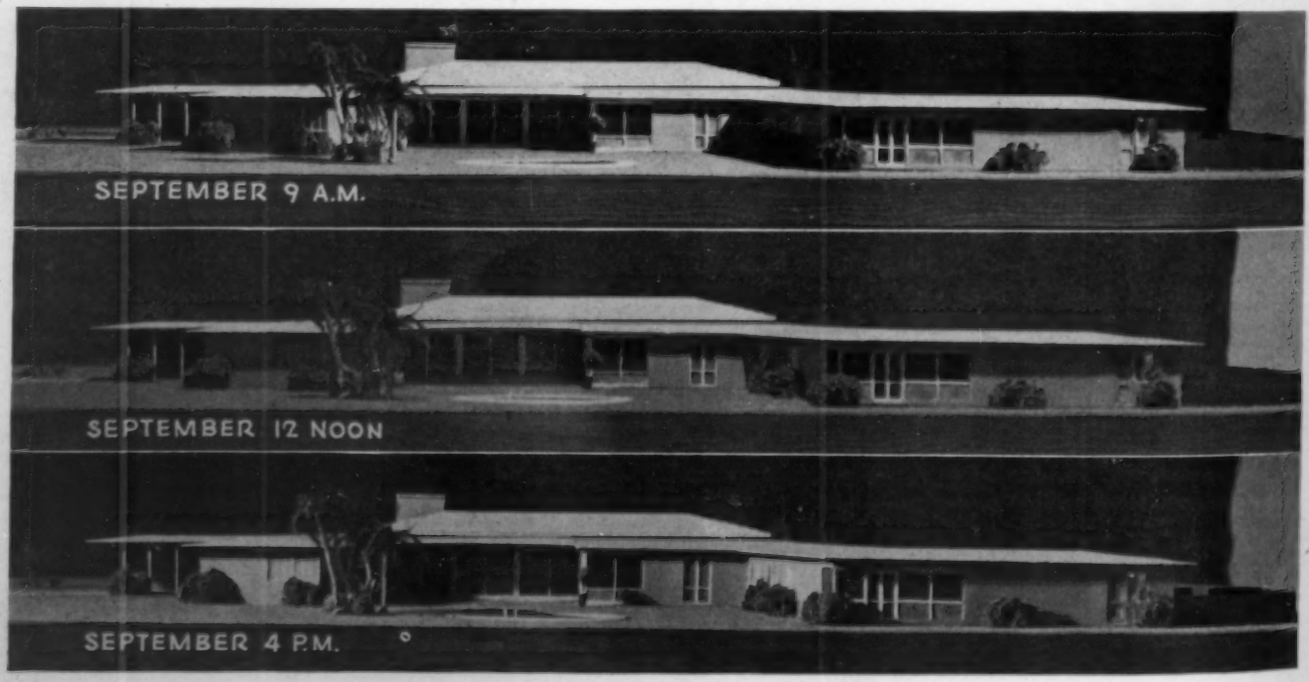
WHILE this house, for Mr. and Mrs. Howard Bald in the Ojai Valley, has basic qualities of many Neutra houses, the handiwork is not so quickly seen as in some others. The ubiquitous sliding door is there, this time opening the living room into a screened porch. More striking departures, perhaps, are the textures and contrasts, both inside and out. The exterior is cement plaster, oyster white, and natural Redwood spar varnished, with the steel sash in deep red brown. Interiors are smooth cement plaster, also oyster white, with chocolate brown in book shelves and closet walls. Carpet is sandy beige and draperies are homespun.

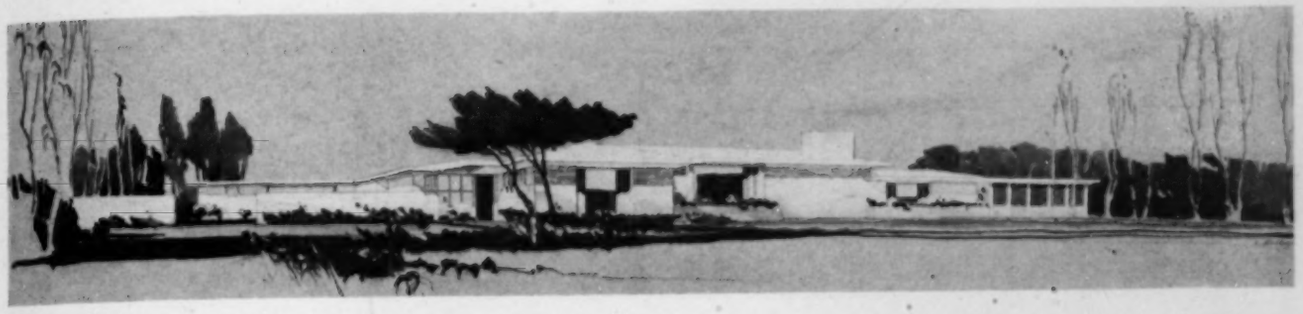


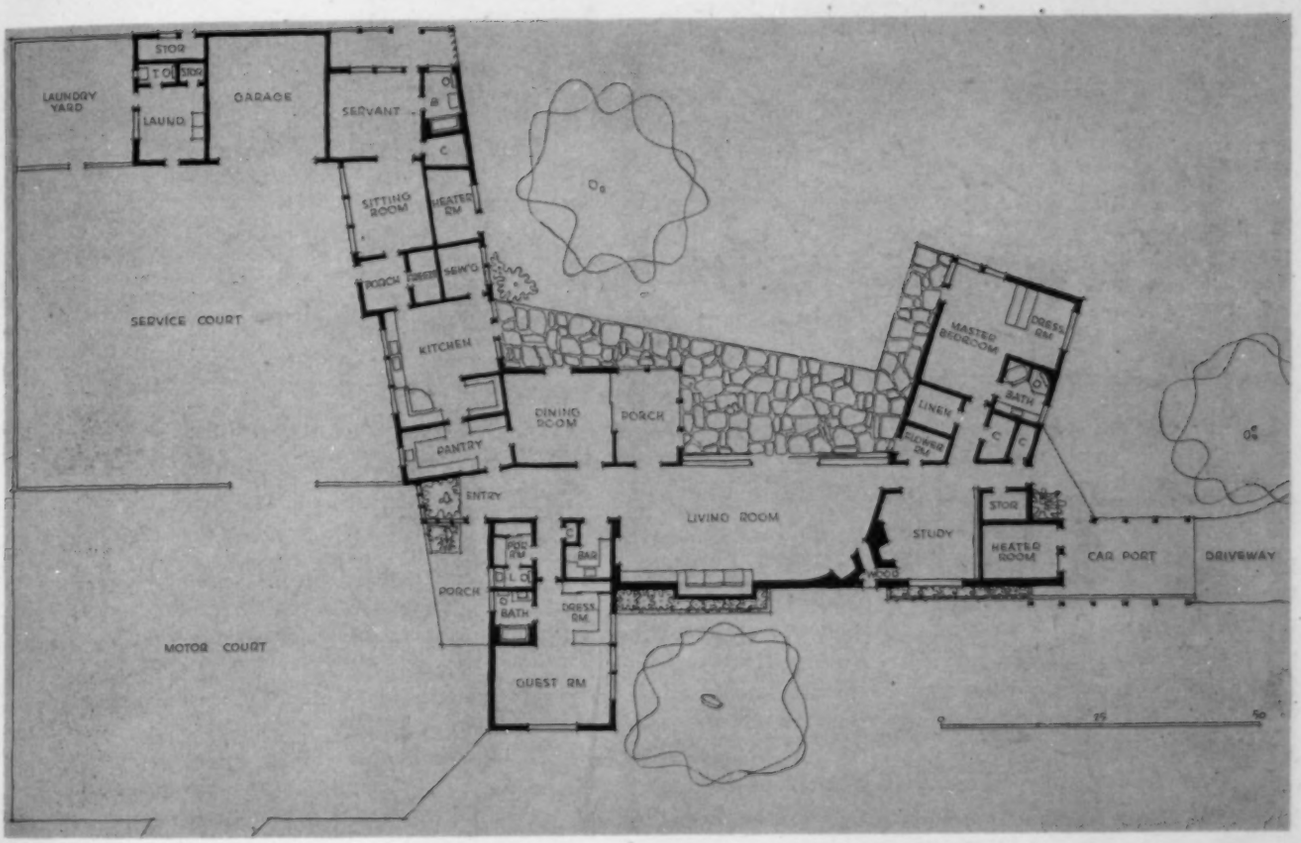
ARIZONA'S SUNLIGHT AND SHADOW PREDETERMINED

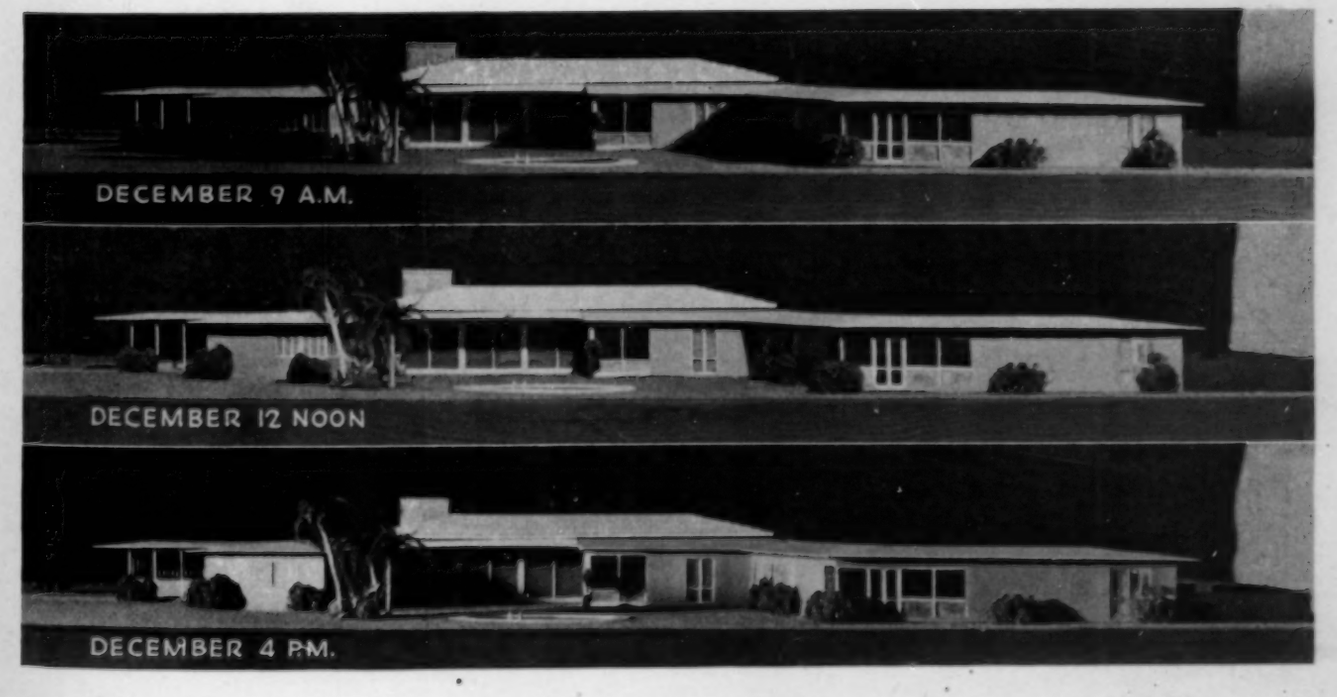
Kaufmann, Lippincott and Eggers, Architects; Model by Imagineering Associates

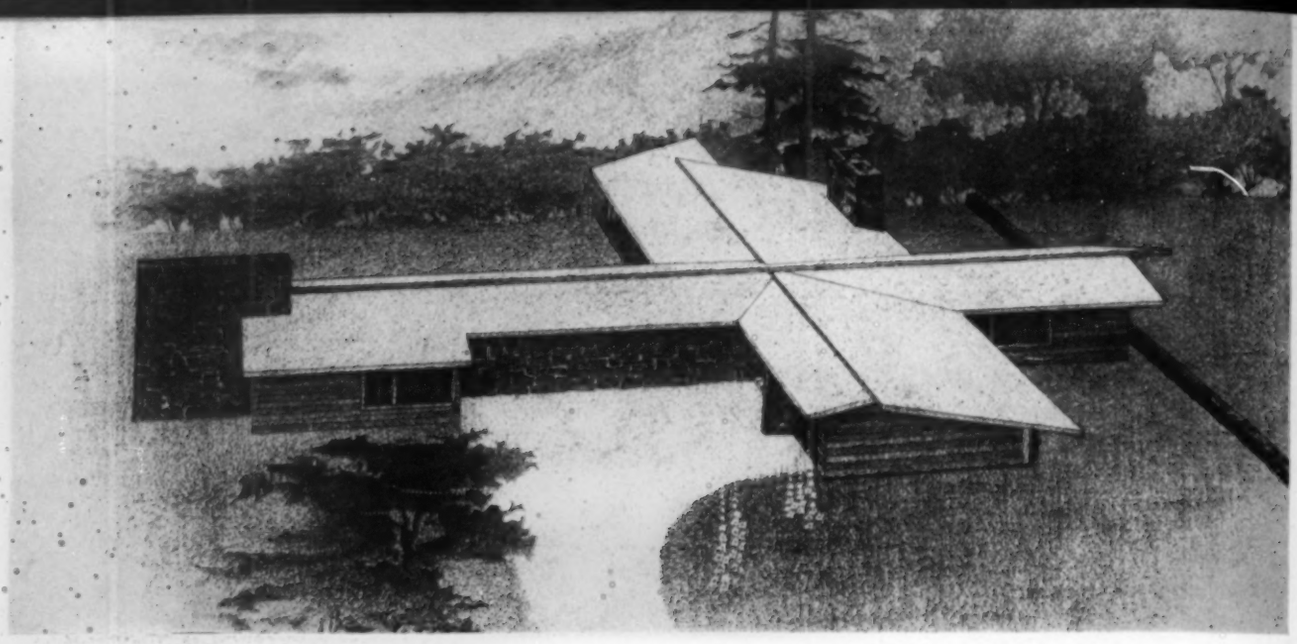
CAREFULLY calculated control of sunlight and shade by extended roofs and louvers was checked and proved by tests with the scale model. The photos show summer sun excluded, winter sun invited. An 8-ft. adjustable louver overhang controls the south sun on the plate glass windows of the living room. The hospitable plan is admirably suited to the needs of a retired bachelor who enjoys entertaining, and both the structure and equipment — including full insulation, acoustical plaster and a two-zone year-round air conditioning system — assure the comfort of a controlled environment. The owner's wing and living room are controlled separately from the guest and service wing. The roof is insulated, being of vermiculite, the flat roofs covered with tar and gravel. Walls are 8-in. brick, the floor concrete slab with finish materials appropriate to the particular rooms.






STOR
LAUNDRY YARD
T.O.
STOR
GARAGE
LAUND.
SERVANT
SITTING ROOM
HEATER RM
PORCH
SERVICE COURT
KITCHEN
PANTRY
DINING ROOM
PORCH
MASTER BEDROOM
DRESS. RM
BATH
LINEN
SHOWER RM
ENTRY
LIVING ROOM
STUDY
STOR
HEATER ROOM
CAR PORT
DRIVEWAY
PORCH
BAR
BATH
DRESS. RM
MOTOR COURT
GUEST RM
0
25
50


DECEMBER 9 A.M.
DECEMBER 12 NOON
DECEMBER 4 P.M.

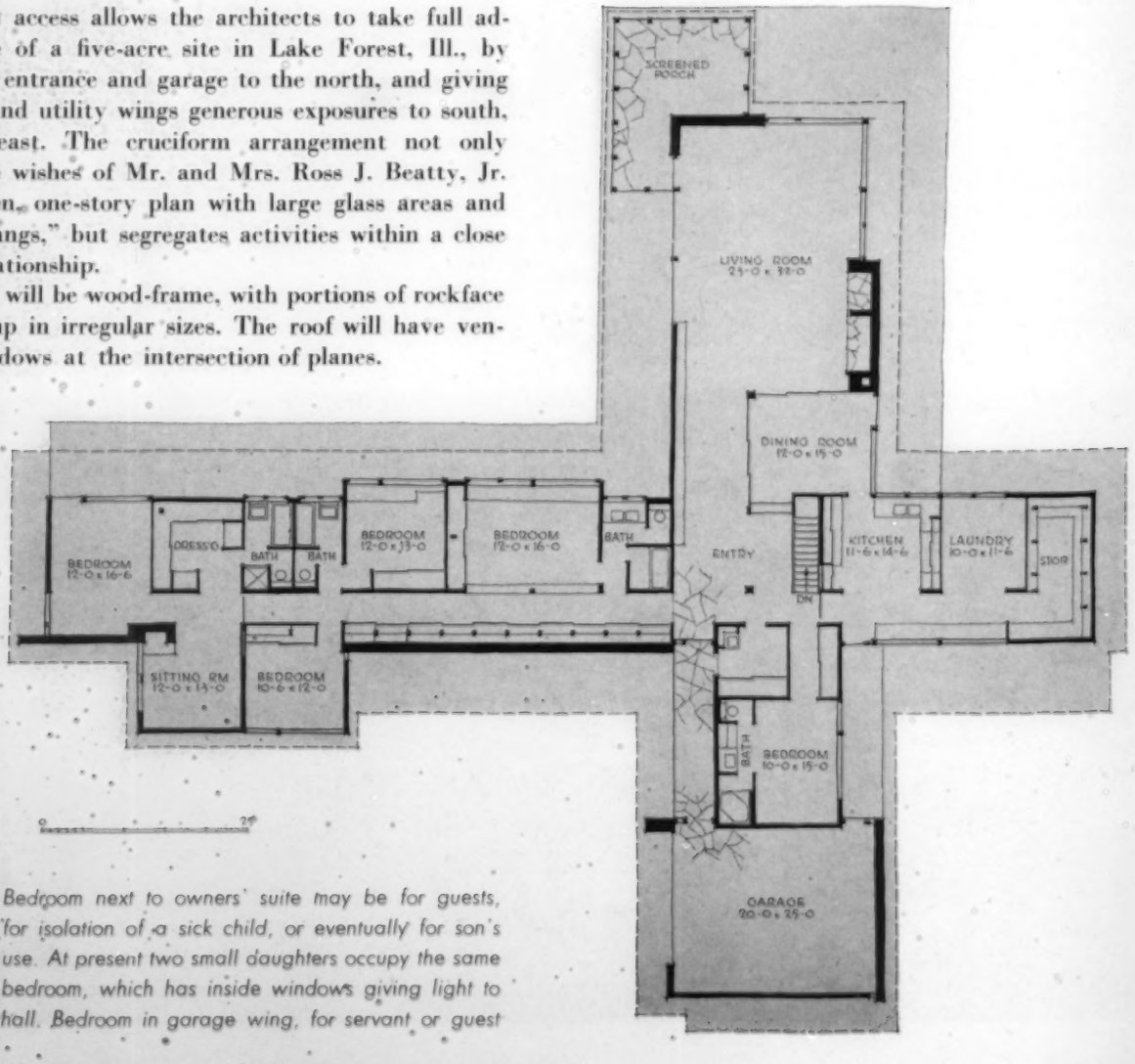


WHERE EACH WING HAS ITS FUNCTION

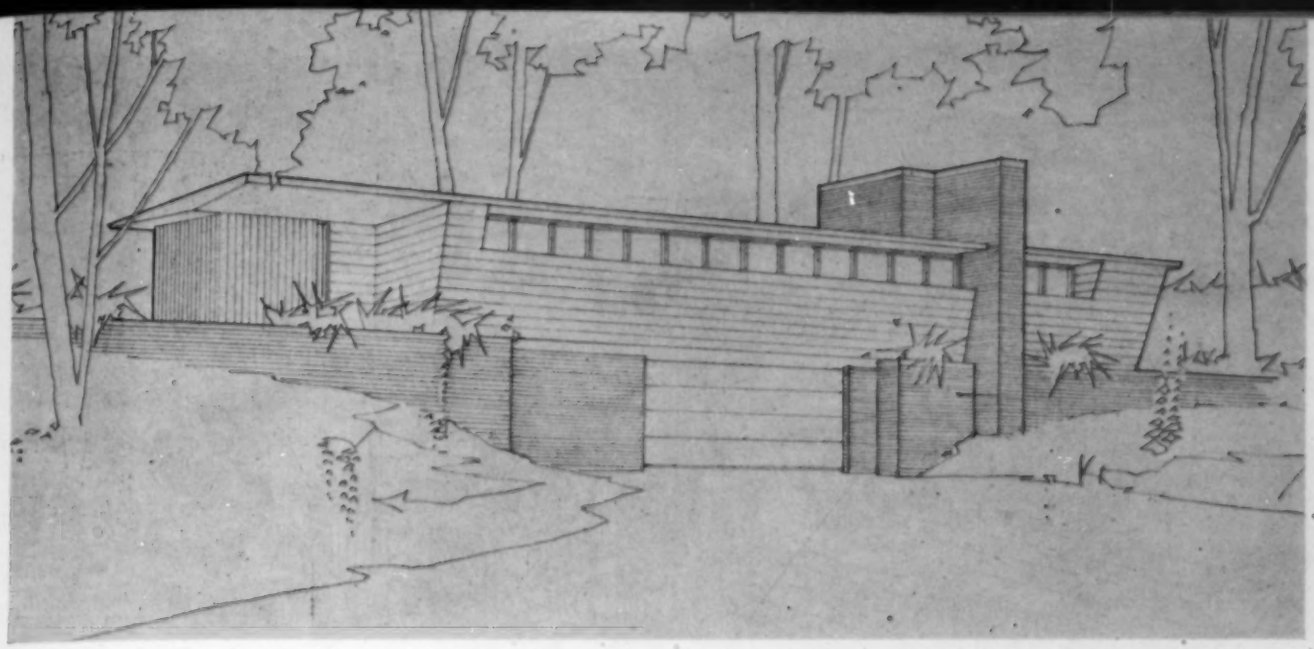
Schweikher and Elting, Architects

NORTHERN access allows the architects to take full advantage of a five-acre site in Lake Forest, Ill., by placing the entrance and garage to the north, and giving the living and utility wings generous exposures to south, west and east. The cruciform arrangement not only answers the wishes of Mr. and Mrs. Ross J. Beatty, Jr. for an "open, one-story plan with large glass areas and wide overhangs," but segregates activities within a close working relationship.

Structure will be wood-frame, with portions of rockface stone laid up in irregular sizes. The roof will have ventilating windows at the intersection of planes.



Bedroom next to owners' suite may be for guests, for isolation of a sick child, or eventually for son's use. At present two small daughters occupy the same bedroom, which has inside windows giving light to hall. Bedroom in garage wing, for servant or guest



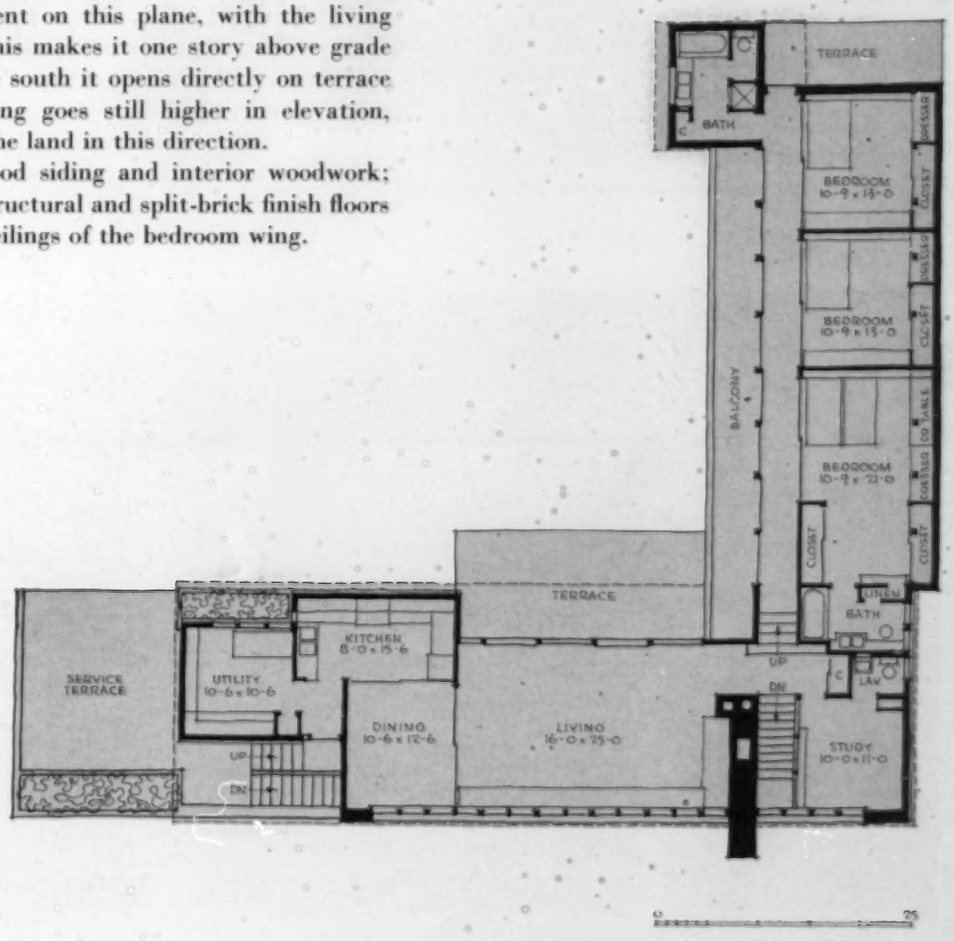
DESIGNED TO BRIDGE A SITE CLEAVAGE

Schweikher and Elting

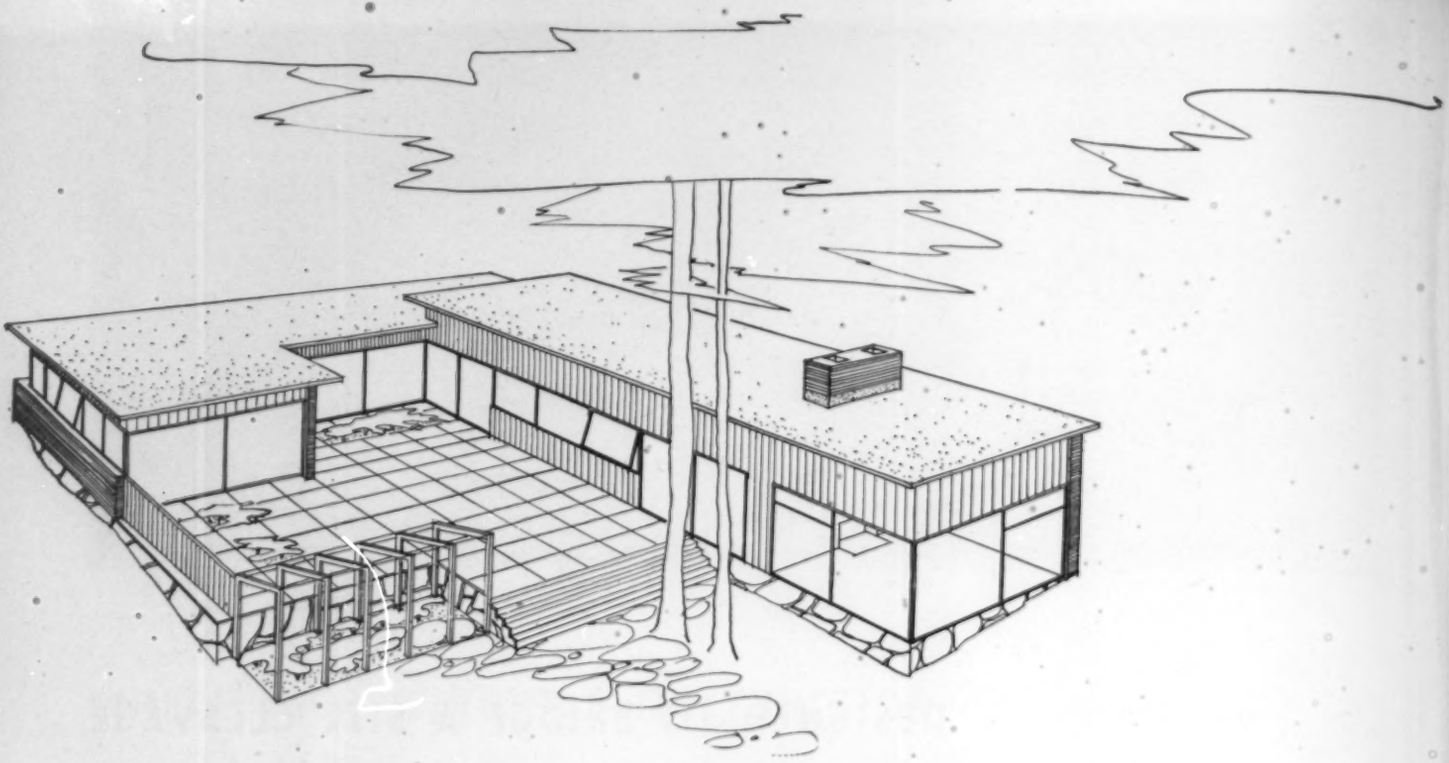
Architects

A SEEMINGLY awkward site factor — a ravine cutting practically down the center — has been capitalized here for Mr. and Mrs. Donald L. Berg at Glen Ellyn, Ill. Since the lower end of the ravine is approximately level with a highway, the architects have placed the garage and basement on this plane, with the living room cantilevered overhead; this makes it one story above grade on the north side, while to the south it opens directly on terrace and garden. The bedroom wing goes still higher in elevation, following a continuing rise of the land in this direction.

Specifications call for redwood siding and interior woodwork; copper heating coils between structural and split-brick finish floors in living wing, and in plaster ceilings of the bedroom wing.



Access to the living area is by an entrance directly to right of garage doors, leading (through the chimney-pylon) to the interior stairs shown in the plan. Exterior stairs lead from the left of garage doors to the service entrance. There is a special entrance for the two Berg children, at the south end of the bedroom wing, with a shower and play-clothes closet immediately handy. The study will serve also as a guest room. The west wall of bedroom wing has a strip of sash at top for cross ventilation



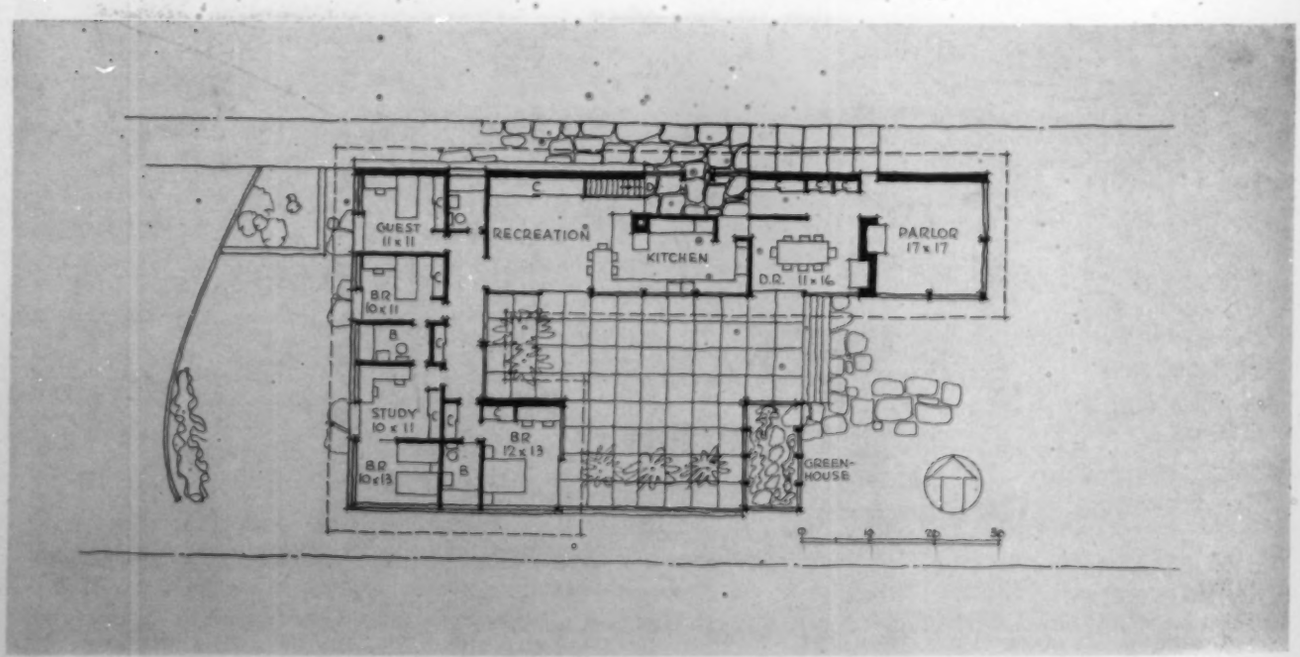
FOR ACTIVE LIVING WITH A BROAD OUTLOOK

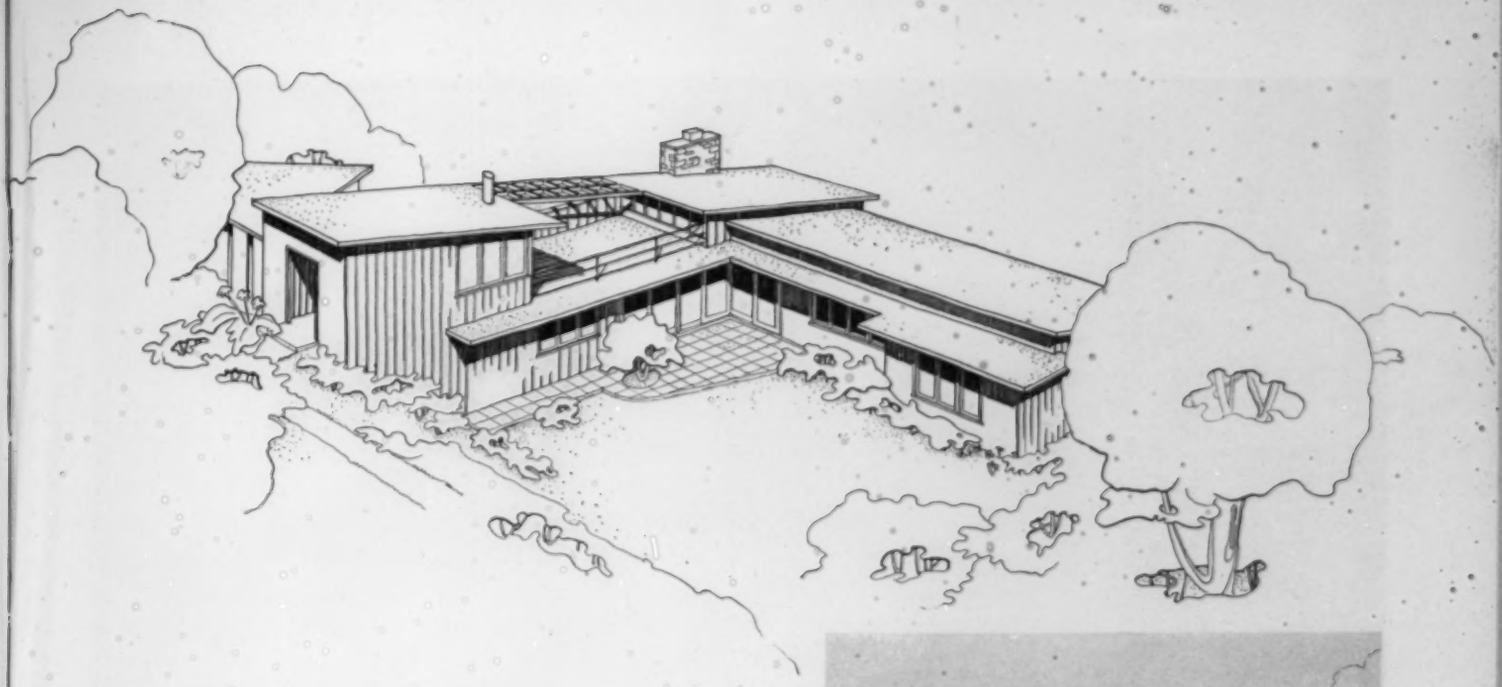
Paul Thiry, Architect

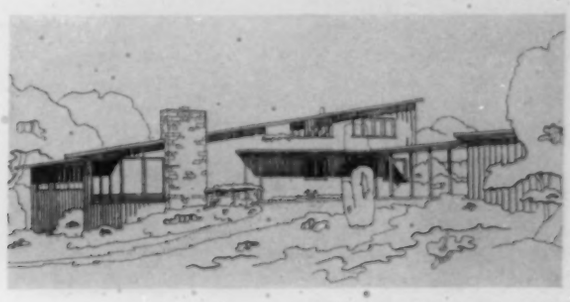
LOCATED on the water and facing east with a broad view of the Cascade Mountains, this house near Seattle is designed for an active family with three children. Two of these are twins, which accounts for the combination bedroom and study. The third child has the bedroom beyond the adjoining bath.

The recreation room, with a charcoal broiler and an informal dining table adjoining the kitchen, is the center of family activities. Withdrawn from this is a dining room for formal events and a parlor primarily for adult purposes; each has its own fireplace. The master bedroom, like the dining and recreation rooms, opens onto the terrace which faces the view and the water and is sheltered from the north.

A basement contains the laundry and heating plant; the garage is separate from the house and near the road.





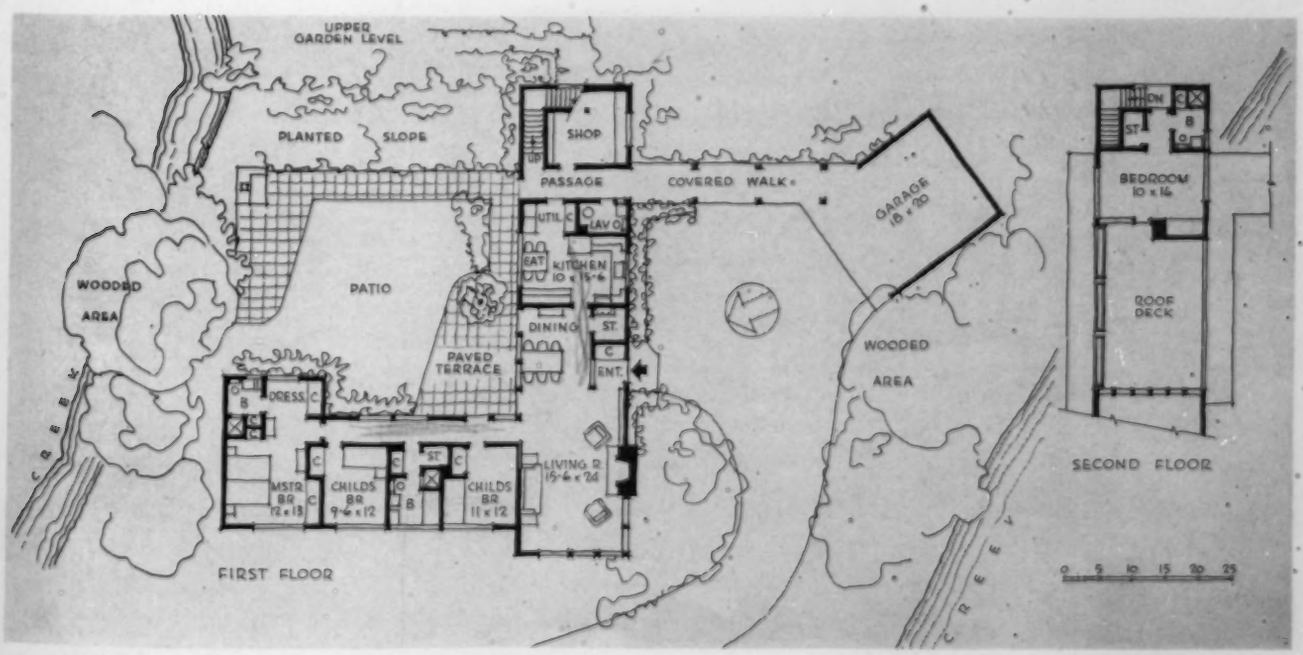


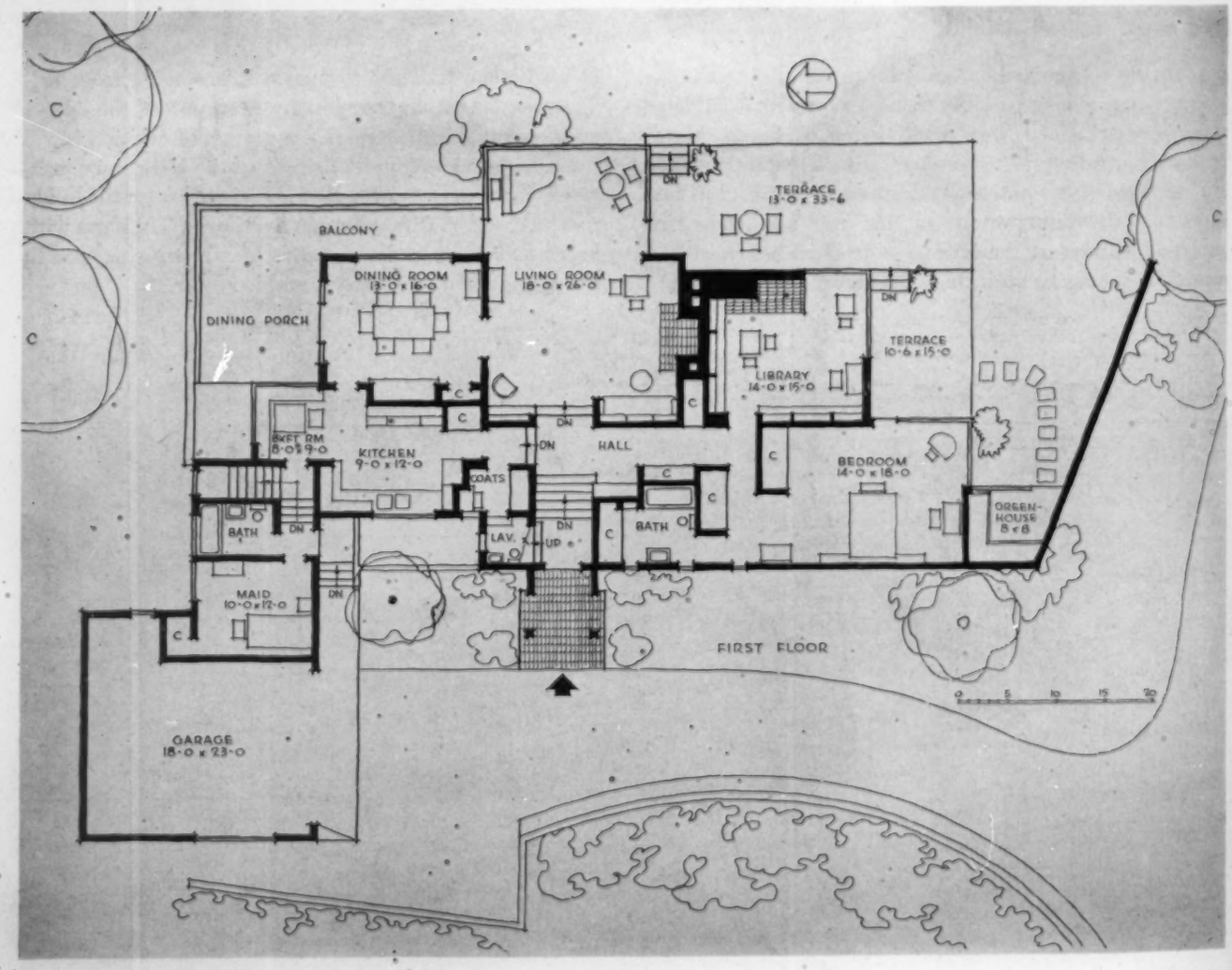
SET AGAINST THE WINDS

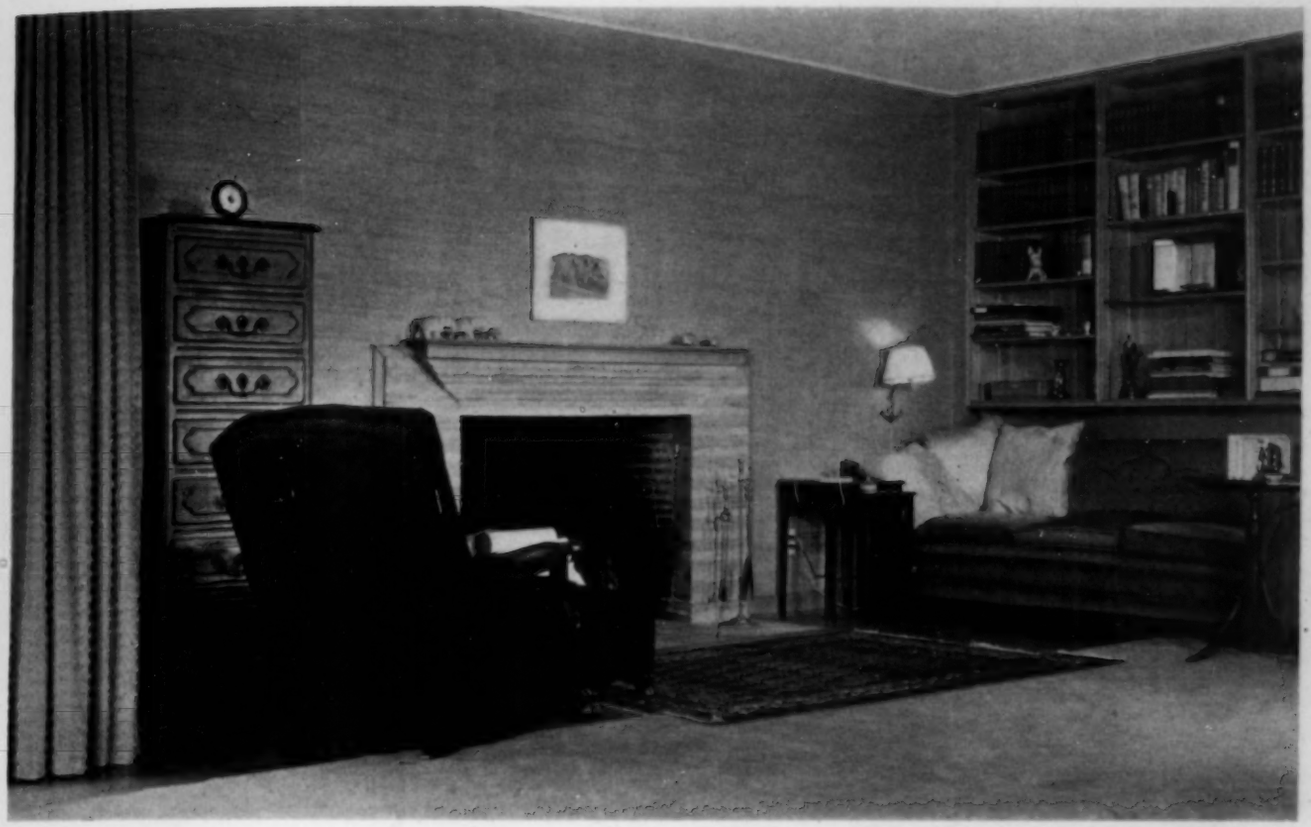
Howard Moise, Architect

PROTECTION from winds and placing of the entrance drive at the only possible point," says the architect, "largely determined this plan" — for Mr. and Mrs. Arthur R. Anderson at Orinda, Calif. Apparent northern exposure of the patio may seem inconsistent, but he explains: "Prevailing winds in this area are from the west and northwest; however due to local land configuration a strong back draft often blows across the site from the south. Thus the patio is protected from this direction and from the west by the mass of the house, and from the north by a dense growth of oak and bay."

Principal view from the site is to the west and southwest; the plan permits this to be enjoyed from the living room as well as from all main bedrooms. The shop with bedroom above (a den for Mr. Anderson, when not in use as a guest room) may be added later.



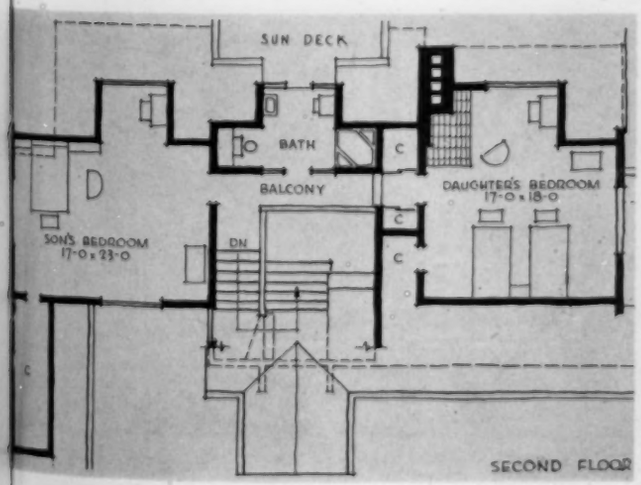

TERRACE
13'-0 x 33'-6
BALCONY
DINING ROOM
13'-0 x 16'-0
LIVING ROOM
18'-0 x 26'-0
DINING PORCH
TERRACE
10'-6 x 15'-0
LIBRARY
14'-0 x 15'-0
BKFT RM
8'-0 x 9'-0
KITCHEN
9'-0 x 12'-0
HALL
COATS
BEDROOM
14'-0 x 18'-0
GREEN-
HOUSE
8'x8'
BATH
LAV.
BATH
MAID
10'-0 x 12'-0
FIRST FLOOR
GARAGE
18'-0 x 23'-0

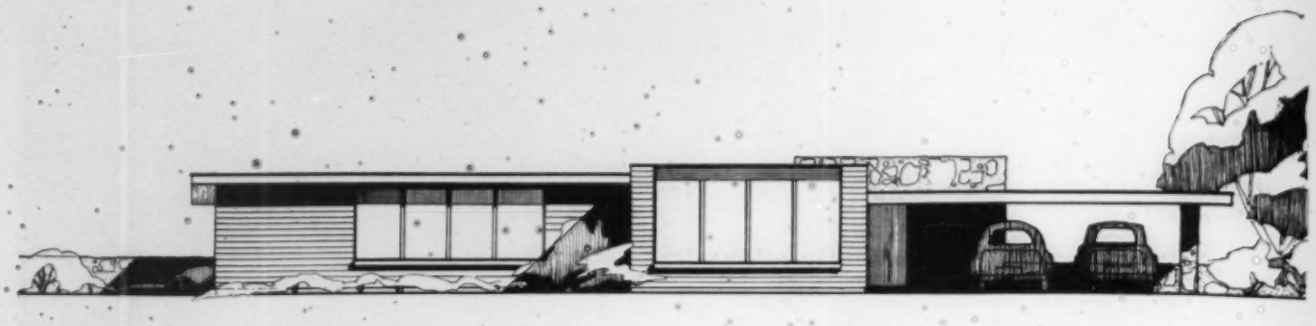


NORTHWEST FREEDOM

Herman Brookman, Architect

ASSUMING the freedom that seems characteristic of designers in the Northwest, the architect has put together a rather imposing list of requirements to make a livable and unpretentious house. At least, if the spaciousness is apparent in the interior, the house settles on its hillside without self-consciousness. While it is almost blind on the road façade, it opens without restraint on the downhill side, with various sunny vantage points. The client: W. R. Scott, Portland, Ore.

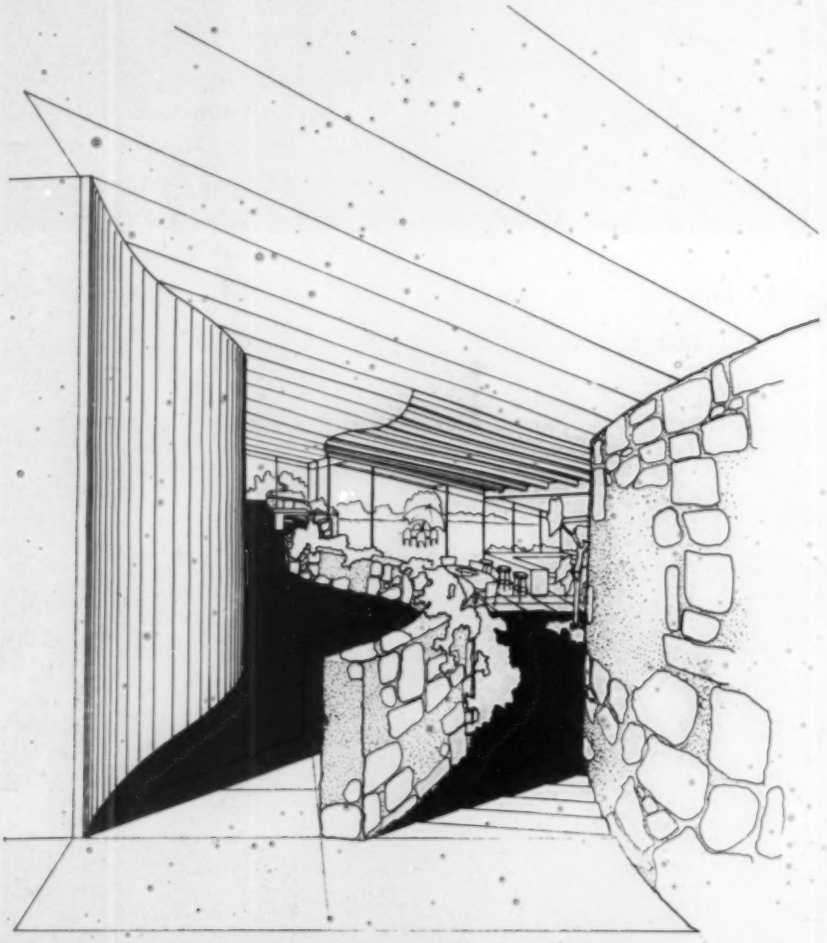




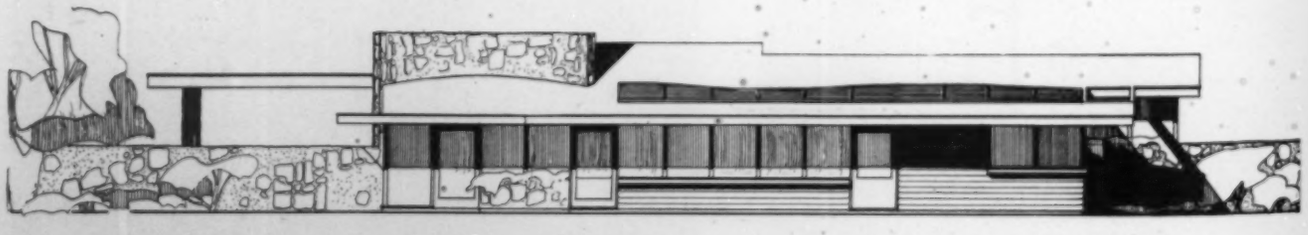
ENTRANCE ELEVATION

WHERE THE WHOLE GARDEN MOVES INTO THE HOUSE

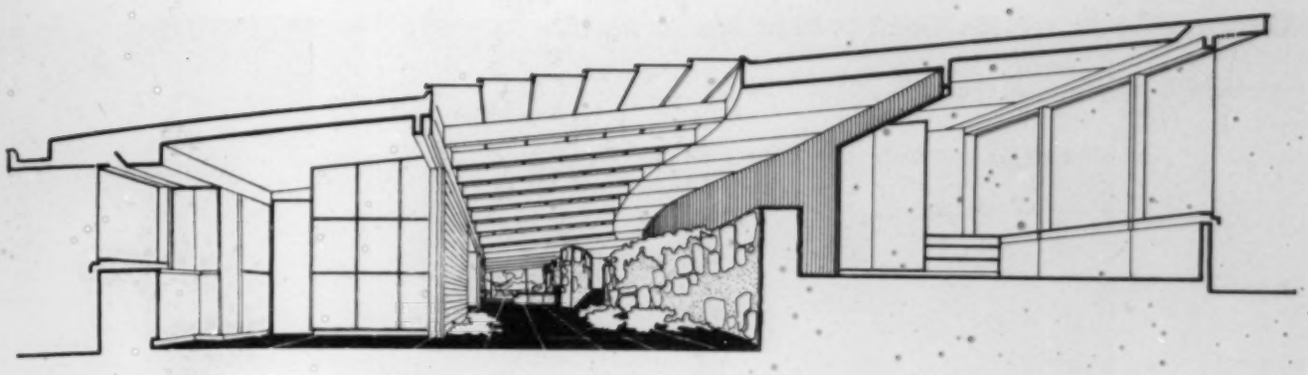
Fred Langhorst, Architect

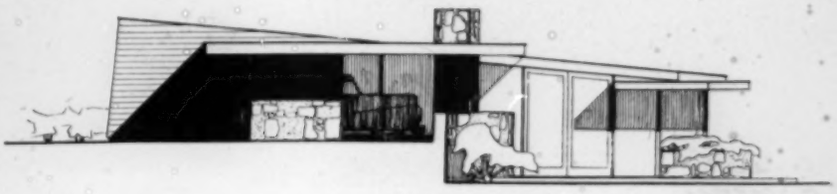


STARTING modestly with flower boxes in living rooms or entrance halls, the trend toward interior gardens has progressed, with planting strips creeping in through glass walls, until here we have the garden shaking off all inhibitions and dominating the whole house. In a warmer clime it would be the familiar patio, but here it is completely enclosed with skylight and glass doors. Thus it has a utility and an importance not accorded the patio; it becomes a central hall. All other rooms may merge with the garden room, or retire from it behind overhead rolling doors. The playfully curving wall accomplishes a change in level for the studio and two bedrooms, the upper hall becoming a terraced balcony overlooking the garden.

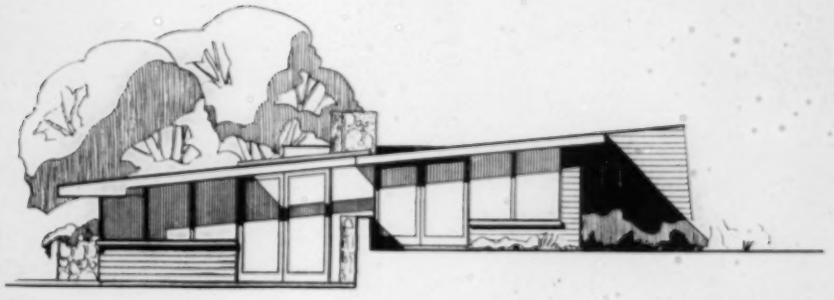


SOUTH ELEVATION



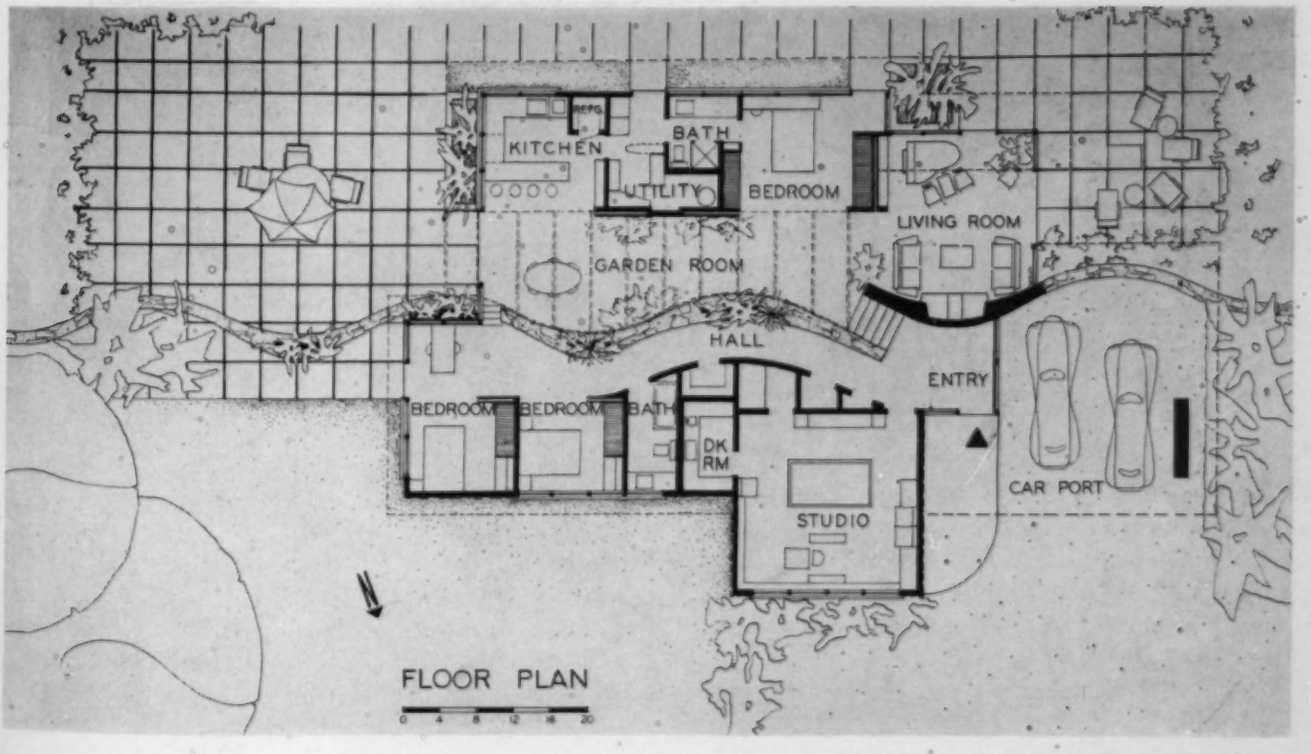


WEST ELEVATION



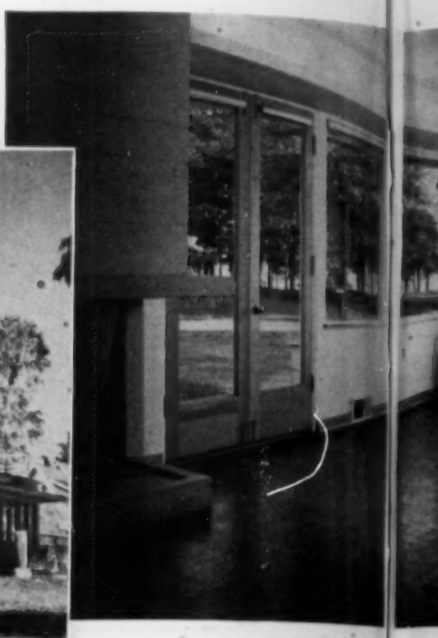
EAST ELEVATION

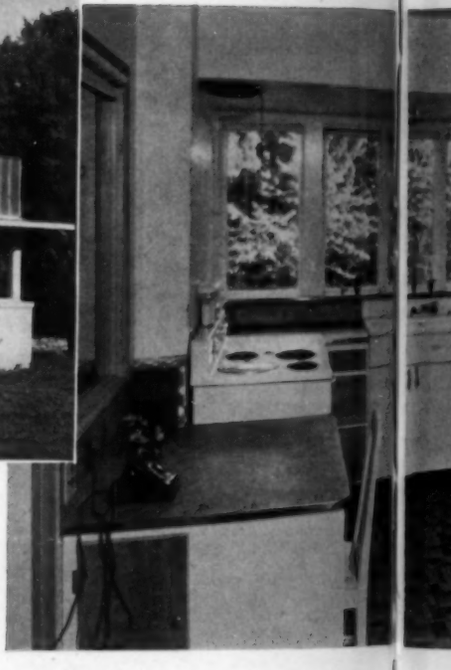
This house, designed for Mr. and Mrs. Gerald Wright, Woodside, Cal., is planned so that it can be built in stages, the upper half of the plan representing a complete living unit while awaiting the complete realization of the larger concept. The house will be built on a concrete slab floor, with copper tubing panel heating coils in the slab. The larger windows will have fixed glass, with screened vents below and metal louvers above. Exterior walls will be 1 by 10 in. horizontal siding



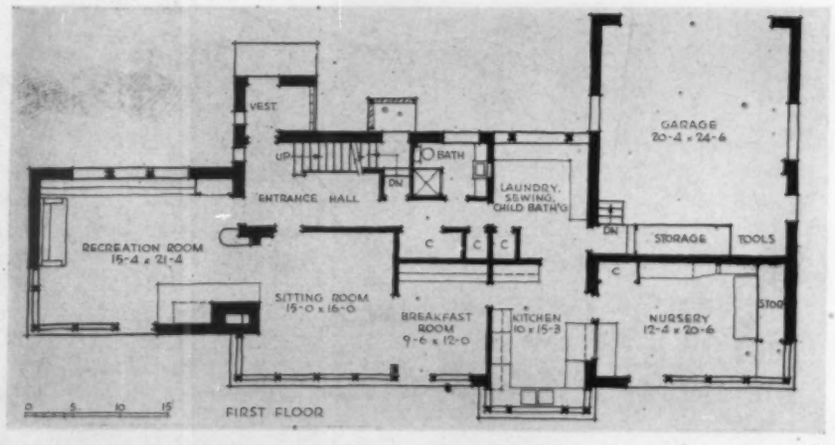
Residence for Mr. and Mrs. Harris D. Dean, Lansing, Mich.

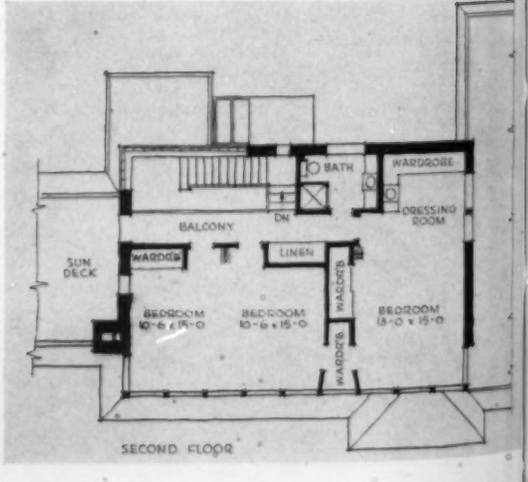
George B. Brigham, Architect

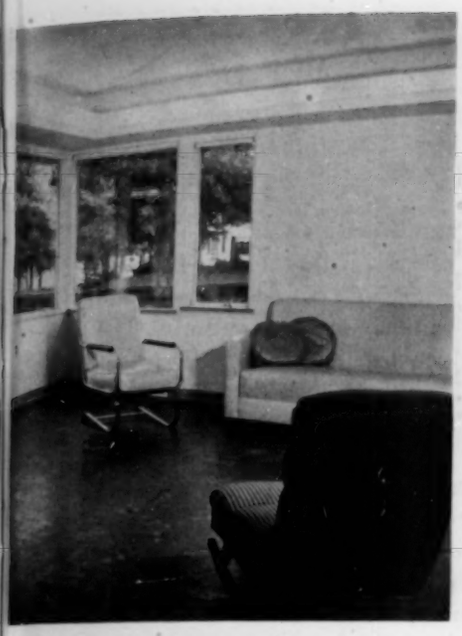




Ivory Photos







FOR THE CHANGING PATTERNS OF FAMILY LIFE

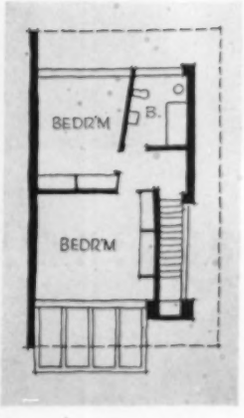
HAVING two very young children, the clients wanted a house to anticipate changing patterns of living as the children grow. For the present the kitchen is the focal center about which are grouped the nursery, lavatory, laundry and sewing room, as well as the dining area. Here Mrs. Dean and a helper can take care of all of the babies' needs without leaving them. The combination of sitting room and recreation room will be especially appreciated later on, as the children tend to take over the living area. At such time folding doors will partition off the sitting room as well as the breakfast room, so that the parents need not be engulfed or the children driven to out-of-the-home social life. Similarly the bedroom area is given flexibility by the folding partition idea. Facing between first and second story is V-jointed aluminum. Windows are solar glass in roll-screen sash. Light shelves throughout the first floor give completely indirect lighting.

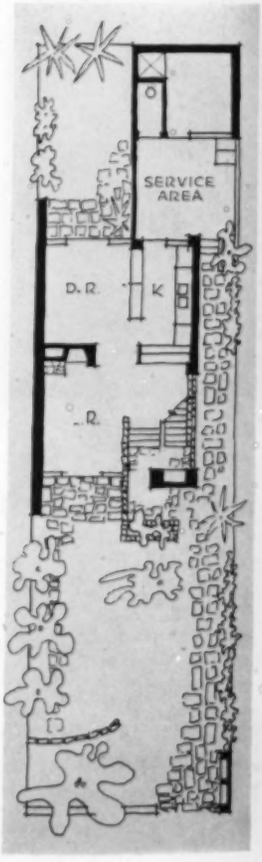
Curt Photos

ON A LONG NARROW LOT

House in São Paulo, Brazil; Ruchti & Forte, Architects

MANY interesting features distinguish this compact, attractive residence built within narrow lot lines. The house is fireproof as it is built of brick and concrete, with structural clay tile fillers for floor and roof. The two-way concrete floor construction is extended without fillers to form the exterior trellis over the living room. The overhangs and vertical wall extension are carefully planned to shade the rooms and what appears to be siding under the upper windows is actually a simple system of louvers for thorough ventilation. The horizontal grill divisions on the first floor are a necessary security measure rather than an esthetic whim. Advantage is taken of the slope of the lot with the entrance slightly higher than the main floor. A quickly drawn curtain provides privacy by shutting off the entrance and stair from the living room when occasion demands, but adding spaciousness when left as shown in photograph below. Built-in cabinets and closets provide storage space and avoid excess furniture in small rooms.





ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

HOUSE BUILDING MATERIALS REAPPRAISED

By H. Vandervoort Walsh, Architect

LOOKING back to war years, we remember that the cardinal tenet in war-born "dream house" propaganda was that new building materials would be legion and revolutionary, differing drastically from anything we had ever known. These new materials, incubated by the demands of war, were to be the leading factors in that new and extraordinary postwar house.

The fact is that most of the predicted new materials are not here — and in the foreseeable future will not be here; a circumstance that has interfered with our making a realistic appraisal of the materials we do have, old, improved, or new, and how we can best use them.

First of all, let's take stock so that we may have an accurate inventory of all the materials available for our use. Though we have, actually, only two important newly developed materials, there has been a veritable cascade of new applications of the time-tested old stand-bys. And many familiar materials have been improved. One should recognize all of these materials — the new ones as well as the many new applications of the old, and know their characteristics, how they are produced, and all the various ways in which they can be put to work in actual design and construction. Then and only then can we make intelligent selection from the rich and varied catalog of materials on hand.

In my opinion, the two most important newly-developed materials in the postwar building process are the aluminum alloys and the big family of plastics; and among improved materials and methods, lightweight concrete and the steel house chassis.

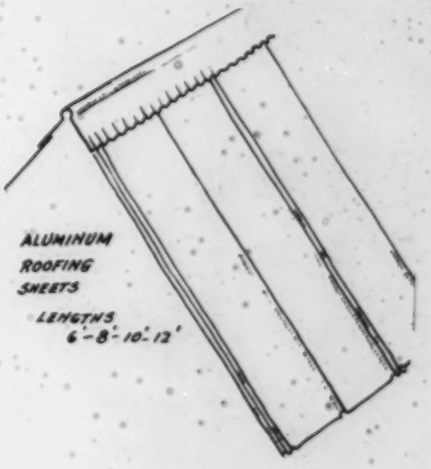
ALUMINUM ALLOYS

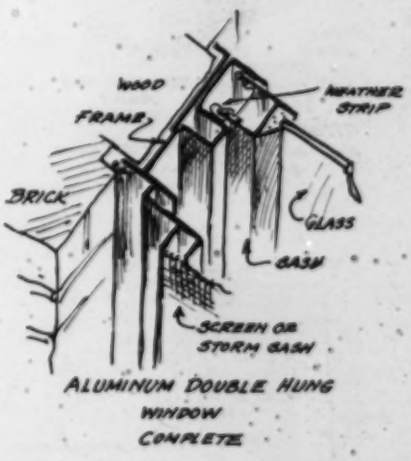
Strength: Pure aluminum is a comparatively weak material for construction. Its tensile strength is only 5 to 9 tons per sq. in. as compared to that of structural steel which is 40 tons per sq. in. Aluminum alloys, however, run as high as 25 to 35 tons per sq. in.

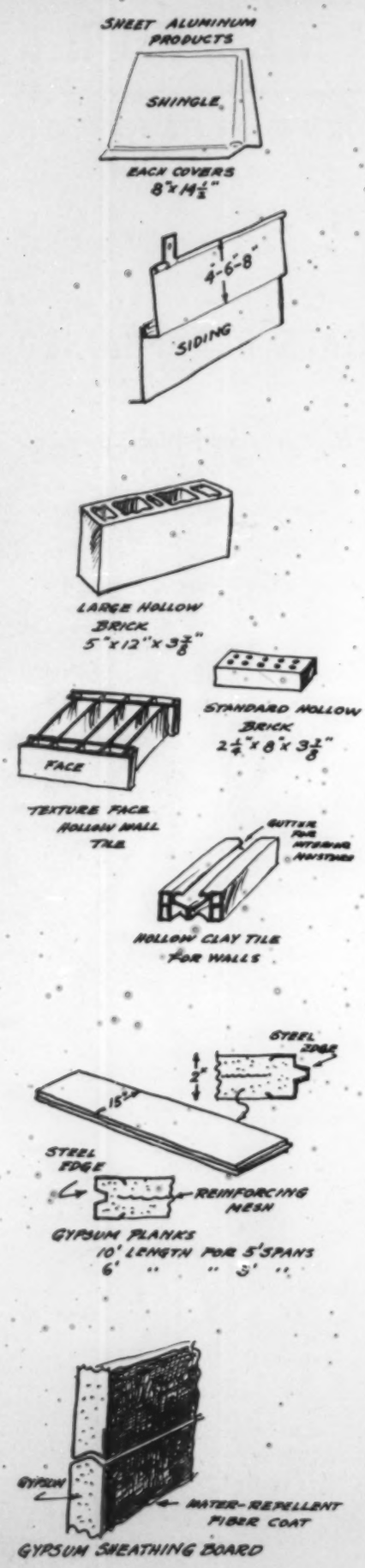
When aluminum alloys are cast, they are in their weakest form. The billets may be worked, however, by forging with a hammer or press, rolling in the hot or cold stage into strips or sheets, extruding into moldings or drawing into tubes or wires. After this working, the metal becomes much stronger. Indeed, to a large extent, the mechanical properties of work-hardened aluminum alloys depend upon degree of working.

Heating and Aging: A well-known alloy, "Duralumin," is not only hardened by working but also by heat-treatment. When heated and quenched from 500° C. it becomes soft, but after standing several days its strength increases considerably above the original figure. This behavior is quite different from steel which reaches its maximum hardness just after quenching. Thus aluminum has the capacity of age hardening; and there are some aluminum alloys which require only low-temperature precipitation to produce greatest strength when allowed to stand or age. Other alloys may be given a double heat-treatment to bring out their maximum strength, with the aging period playing an important role.

Shapes and Forming: Aluminum alloys may be worked into shapes, cold, but if there are too many operations, intermediate annealing may be necessary. Many, in fact most, aluminum struc-







tural shapes are made by extrusion, i.e. forcing the metal through a die of the desired section. Besides the usual I-beams, angles, T-bars and channels there is an exceedingly wide range of different stock shaped sections being made. Then, too, the war promoted some new methods of forming aluminum into useful patterns. One makes use of the rubber die press and stretching press for sheet metal components.

Weight: The light weight of aluminum has greatly stimulated its use for construction of mobile objects like planes, trucks, railroad cars and the like. Its application to static structures such as houses has thus far been slower, but we shall undoubtedly see giant strides in this direction in the near future, due to the expansion of the world's capacity to make aluminum. The fact that this capacity at the end of the war was about six times that of the output of 1935 is convincing evidence that aluminum alloys will play a large part in the building of houses in the immediate years ahead.

For example, the lightness of aluminum makes it possible to shop fabricate large units that are easy to transport, handle and install, since a cubic foot of aluminum weighs only 172 lb. as compared to 486 lb. for a cubic foot of steel.

Corrosion Resistance: The aluminum alloys do not corrode as fast as iron or steel, but their resistance varies with the amount and kind of metal used in the composition of the alloy. For example, unlike steel, an aluminum alloy containing copper is less resistant to corrosion. In fact, the copper-free alloys are superior in resisting this form of disintegration, and when the aluminum is mixed with magnesium the alloy is made especially resistant and holds up well in salt air.

Aluminum alloys are very electro-negative in contact with other metals, and if placed in close contact with copper will corrode rapidly. When in any design it is necessary, therefore, to combine these alloys with other metals, they should be insulated with asphaltum, zinc or chromate priming. Protective fiber washers are used on the heads of screws and bolts.

Structural aluminum parts which must be exposed to damp weather conditions should be kept free of dirt deposits which retain the moisture. Under severe conditions of exposure the metal should be painted with asphalt enamel. Maximum resistance to corrosion can be assured by plating the structural unit of heat-treated aluminum with pure aluminum (Alclad), a process that has been used extensively in making aircraft.

Methods of Joining: The oldest method of fastening aluminum sheets and sections is riveting with solid or tubular rivets. The rivets may be made of pure aluminum, duralumin or alloys containing magnesium.

Welding has been successfully employed at the building site, and castings are readily welded by the arc process. Aluminum is capable of being gas welded if the techniques used are specially adapted to the properties of the metal. For example, an increased magnesium content necessitates different flux mixtures. All wrought aluminum alloys require high current densities in spot welding, so work requiring this method is done better in the factory than on the building site.

ALUMINUM BUILDING MATERIALS

Aluminum has come into the building process slowly and has been used in the smaller components such as doors, windows, trim, moldings, roofing and wall surfacing. It has proved useful and justifies the contention of those who predicted that it will take over more of the major parts of the building process.

Windows: Windows of aluminum alloy sections have a good record. In general, it seems safe to leave them unpainted. Even in the case of kitchen and bathroom windows where damp air is common, it has been found that if the metal is wiped clean at the same time as the glass it remains in excellent condition. In polluted atmospheres it is advisable to take the extra precaution of painting or anodizing the aluminum. (Anodizing is an electro-plating process wherein the aluminum is given a covering film of aluminum oxide which resists further oxidation and corrosion.)

An aluminum sash sliding in an aluminum frame is inclined to scuff. This scuffing action is eliminated, however, when the sash is made of magnesium sections. The recent reduction of the cost of magnesium sections, making them compare favorably with aluminum, may bring about a combination of these two metals for window construction.

Doors: Doors made of aluminum alloys are light, free from warping, and require no paint. The simplest form of construction is made with pressed sheets, with beaded edges turned over and stiffening members spot-welded on the surface. Composition doors made with aluminum sheeting on a plastic base or fiberboard fastened over a framework of extruded sections are also practical and provide a labor-saving building item when used with a combination frame and trim.

Moldings: Ease of fabrication and consequent wide choice of shapes makes aluminum alloys a number one choice for moldings, trim, baseboards, etc. They are easily drilled for screws and

bolts, and quickly cut to lengths. They can be welded at mitered corners.

Roofing: We are also beginning to see a wider acceptance of aluminum alloy as a roofing metal. Here its lightweight and non-corrosive qualities offer distinct advantages over many other kinds of roofing materials. Joints between sheets may be made with lapping, or by turning the sides down into a channel formed in the aluminum alloy extruded support and filling up the channel with bituminous compound or covering it with a capping strip.

Numerous Miscellaneous Uses: Aluminum has proved suitable in many other forms such as in the construction of lockers, cabinets, table coverings and wall panels. We can expect to see it used in the framing of walls, partitions and floors on a wider scale than at present, depending upon that ultimate factor — relative costs.

THE PLASTICS PARADE

In considering plastics, we ought to rout another illusion. Plastics should not be regarded as substitutes for other materials. Instead, they should be welcomed as useful newcomers with their own special characteristics and artistic possibilities. Architects who are accustomed to working with old materials that have certain limitations like the grain of wood, the fragility of glass, the weight of metal, etc., may need to acquire an informed appreciation of this new material augmented, perhaps, by working with plastics in their own craft shops.

Realization of the enthusiastic prediction of the widespread use of plastics in house construction depends on intelligent selection and use for each purpose. There are so many different kinds that the characteristics and qualities vary greatly, resulting in possible mistakes in application. (For an analysis of Plastics: Characteristics and Applications, see Time-Saver Standards, ARCHITECTURAL RECORD, June, 1944, pp. 103–108.)

There are certain basic limitations of plastics that seem characteristic, that make them suitable for some purposes and entirely unsuited to others: (1) tendency to cold-creep under ordinary temperatures; (2) brittleness; (3) excessive deflection under loadings; and (4) the narrow range of temperatures within which they can be used with satisfaction.

The tensile strength of plastics varies from 2 to 5 tons per sq. in., with some recently developed ones showing a strength of 20 tons per sq. in. However, actual strength has not been of great importance since plastics have not been applied to major structural components of building.

Kinds of Plastics: There are more than 20 types of plastics in production which can be classified as thermosetting, thermoplastic, or within a third subordinate group of casein plastics. The thermoplastic materials can be pressed into shapes under heat and pressure, and become hard on cooling. They may be softened again by heat and then remolded. This property is useful in fabricating articles but it gives them limited temperature ranges in use.

The thermosetting plastics set permanently when cooled and cannot be remelted and shaped again. They go through an irreversible chemical change and retain their hardness once they have been formed.

Thus far, plastics have only entered the building process in small elements, such as electric fixtures; hardware; plumbing items like knobs, handles, hooks, pipes, and wash basins; table and counter coverings; and as paints and bonding material. There are more ambitious schemes being developed for their wider application, but they still remain in the laboratory.

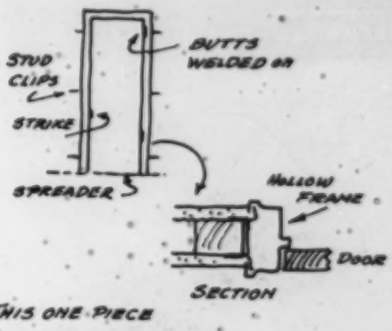
Resin-Plywoods: Plastics as adhesives have made several revolutionary changes in the building process. An outstanding example is the group of resin-bonded-plywoods which have none of the disadvantages of plywoods bonded with ordinary glues.

Phenol-formaldehyde adhesive bonds the layers of wood together so well that a plywood board will withstand prolonged soaking, hours of boiling, and repeated wetting and drying. The 1934 model house of the U. S. Forest Products Laboratory marked the beginning of an era of increasing use of plywoods for all kinds of construction, furthered now by the development of new waterproof boards. While new techniques were learned during the war whereby plywoods could be molded and shaped, these have yet to be applied to the house building process in making structural arches and panels.

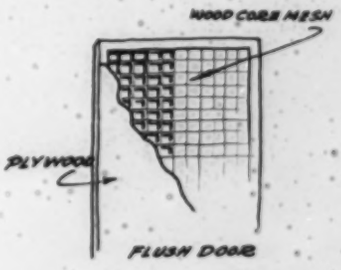
Floor Sheets and Tiles: Plastics applied as floor finishing surfaces are in their infancy, but promise much. Polyvinyl chloride has been made into sheets and tiles that gives a floor that is tough, waterproof, flexible, warm to the touch, and non-slippery.

Coumarone-indene resins have also been made into floor tiles. These have sand or other silicious materials mixed in to give a harder wearing body.

Combinations of plastics with paper also promise to develop some revolutionary structural elements. One of these is the honeycomb plywood laminate, in which the filling between outer coverings of plywood is a plastic impregnated paper. The same principle has been applied with aluminum sheets on the outside. A sturdy 1-in.-thick synthetic board (Holoplast) is made with paper tubes impregnated with a plastic and sheathed on both sides with either paper or wood veneer thoroughly resin-bonded to the core. The round paper tubes are pressed into rectangular shapes, so that each

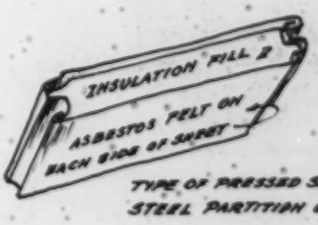


THIS ONE PIECE REPLACES 14 PIECES USED IN OLD TYPE WOOD FRAME & TRIM

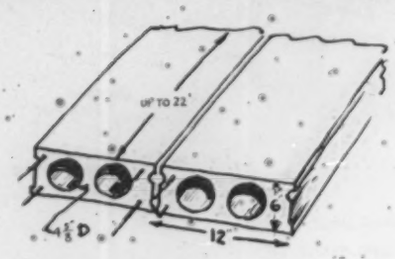


FACTORY FITTED DOORS MORTICED FOR LOCKS SEALED AGAINST MOISTURE PROTECTED BY SCUFF STRIPS

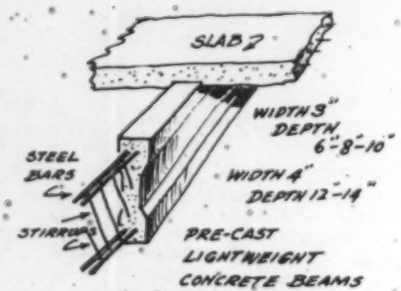
THE THREE IN ONE ASPHALT SHINGLE



TYPE OF PRESSED SHEET STEEL PARTITION UNIT

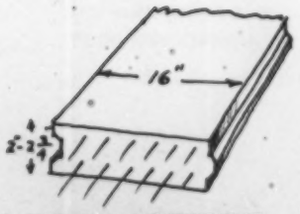


PRE-CAST LIGHT WEIGHT CONCRETE SLABS 40 LBS. SQ. FT.
INFLATED RUBBER TUBES ARE USED FOR CORES TO MAKE THE HOLES



PRE-CAST LIGHTWEIGHT CONCRETE BEAMS MADE BY ROLLING NOT BY CASTING

PRE-CAST LIGHT WEIGHT CONCRETE SLABS FOR 8 FT SPANS OR LESS 13 LBS. PER SQ. FT.



PRE-CAST LIGHTWEIGHT CONCRETE PLANKS FOR 8 FT SPANS OR LESS
CINDER AGGREGATE AND AERATED CONCRETE
2" = 13 LBS SQ. FT. 2¾" = 18 LBS

presents a maximum face for bonding. The half cells at the edges of the board are filled with densified wood. It is claimed that such construction will not support combustion, and will resist termites, moisture, oils, and most solvents.

Plastic Pipe: Plastics have been successfully applied in making pipes for industry, and there is probably a field for them in the house building process. They are lightweight, and more resistant to corrosion than metals. They resist freezing better than metal pipes under certain circumstances, but would rupture under a hard frost. The use of plastic pipes for very hot water is still in development stages, but laminated phenolic plastic tubing has been successful in conveying hot brine.

Paints: The introduction of plastic products into the paint industry began about 15 years ago with resins known as alkyd and glyptal. These lacquers require heating in special ovens, exposure to infrared lamps, or jets of hot gas directed at the surface. The alkyd resins are dried out quickly by the heat process, leaving a hard smooth surface which is weather- and age-resisting.

Other resins are now being used for making paint, such as urea-formaldehyde, melamine-formaldehyde and phenol-formaldehyde. Besides being used as a resin paint which must be heat treated, this last class has been developed into oil-soluble paints that can be applied like other paints and produce excellent weather-resisting finishes.

Shaping Plastics: Since the thermoplastics may be heated and made moldable, they can be reduced to strip form for preliminary handling and marketing. These strips can be melted down and the old extrusion method lends itself to the making of moldings, rods, tubes and fancy shapes.

When the hot fluid is forced through a nozzle into closed molds, intricate shapes may be formed quickly. This is known as the injection molding process.

Thermosetting plastics are molded to shape by compression or transfer molding. The heat and pressure make them fluid and in this state they are compressed to the correct density and forced into the molds.

The transfer molding process is a combination of compression and injection molding. The thermosetting plastic is heated and melted to a fluid below the temperature at which it changes and becomes hard. In this fluid state it is injected into the mold and then pressed until the curing process is complete.

Thermosetting plastics are not used in a pure or "neat" state, but are combined with fillers: wood flour in phenol-formaldehyde resins; in others, shredded cotton cloth, canvas, asbestos, or silica, to obtain certain properties. (See "Plastics, Practically Speaking," ARCHITECTURAL RECORD, April, 1943, pp. 54–59. Also "Plastics and Architecture," ARCHITECTURAL RECORD, July, 1940, pp. 65–76.)

LIGHTWEIGHT CONCRETE

It is obvious that the strength of most masonry walls (built of standard thickness of brick, ordinary concrete or stone) is excessive when used in the construction of small houses. Therefore attention has turned to the development of lighter materials.

Numerous experiments have been undertaken to reduce the weight of concrete. To date, different types of concrete have been made which weigh 70 to 90 lb. per cu. ft. in contrast to the usual 140 to 150 lb., yet with ample strength to meet any structural requirements imposed upon them in dwelling construction.

Cinder Concrete: A popular type of lightweight concrete is made with the screened residue resulting from the quick combustion of bituminous coal, containing not more than 25 per cent combustible material and 5 per cent volatile material. Its weight runs about 40 to 70 lb. per cu. ft. for the fine grade and 30 to 55 lb. for the coarse.

Precast blocks of cinder concrete are not considered a new development. They are now extensively used, because of their low cost, for foundation walls, upper walls, and back-ups for brick and interior partitions. This ready acceptance is an excellent example of the new use of an old material finally passing the test of cost and winning a place in the building process.

Foamed Slag Concrete: Foamed slag is another lightweight aggregate extensively used in those parts of the country near iron and steel mills. It is cellular and made by treating molten blast-furnace slag with a controlled amount of water. After cooling, the slag is crushed and graded as fine and coarse. A mix, consisting by volume of one part cement, two parts fine grade foamed slag, and six parts coarse grade foamed slag, with a cement-to-water ratio of .87 will have, after three months of curing, a weight of 75 lb. per cu. ft. Tests have shown that this mix after three months develops a compression strength of 770 lb. per sq. in. A 1:2:4 mix with a cement-to-water ratio of .74 will develop a compression strength after three months of 1722 lb. per sq. in., and weigh 89 lb. per cu. ft.

Aerated Concrete: Lightweight concrete with a cellular structure, known as aerated concrete, is made with clean

sand and cement, and the addition of a material that produces gas in the mix, such as pulverized metals like zinc, aluminum, and aluminum-magnesium alloy. Other foaming agents are soluble in water like synthetic resins, gelatine, and so forth. When such an agent is used, the aeration is produced by rapid stirring to form a mass of small but stable bubbles through the concrete.

THE STEEL HOUSE FRAME

Development of the steel house frame or chassis is not to be confused with that of the prefabricated steel house. So much has been written about the factory-made house that the public has associated the steel chassis with it alone and failed to remember that steel has long been used similarly in the construction of large buildings. Only its adaptation to the small house has been comparatively recent.

There are two types of steel frame available for house construction: (1) light rolled sections such as junior beams, and (2) sections formed of cold rolled sheet steel, so formed as to permit application of sheet materials by nailing. Mention should also be made of standard bar joists .

Steel frames may be assembled by either bolting or welding. As a rule, maximum economy is obtained by a maximum amount of shop assembly of steel members. If large units or walls, partitions, and roof are framed in steel and sent to the site for quick assembly, costs may be so lowered as to compete with other construction. Naturally this type of construction may require movable crane operations which would indicate a large-scale housing development.

The spacing of vertical steel members depends upon the wall material, usually a module of 3 to 4 ft. Wall materials may be prefabricated and range from precast lightweight concrete to the various types of sandwich construction having insulation contained between metal or asbestos sheet materials. (See ARCHITECTURAL RECORD, October, 1946, pp. 119–123.)

ADVANCES IN OTHER MATERIALS

There is an imposing panoply of new developments in other familiar materials, constituting a list so extensive that space will permit only a general review.

We all know the old standbys: wood, steel and iron, cement, baked clay, gypsum, glass, stone, nonferrous metals and alloys, such as copper, lead, tin, zinc and alloys of bronze, brass, monel, etc. Then there are the miscellaneous products of asphalt, glues, asbestos, cork, felts, cotton, leather, rubber, and paper. Let's look at the new applications of these time-tested materials.

Gypsum Products

Lath and outside sheathing made with gypsum board.

Wallboards with numerous types of coverings.

Floor planking to span the space between steel beams. Edges are reinforced with steel and interlock with the adjoining edge.

Fibered plaster.

Glass Products

Glass blocks.

Foamed glass block insulation for wall back-up, etc.

Burnt Clay Products

New designs for hollow wall tiles and hollow bricks.

Insulation Materials

Fiber insulants (fiber boards, laminated boards, quilting, pads, etc.).

Granular insulants (gypsum, asbestos, mica, slags, etc.).

Foamed materials, like cellular plastics and glass.

Sandwich Sheets

Many combinations of sheets of metal and wood with cores of plastics, fibers, glass, etc.

Roofing Materials

New developments in flat construction with felts and asphalts.

Unit strips of improved ready-made roofing and shingles.

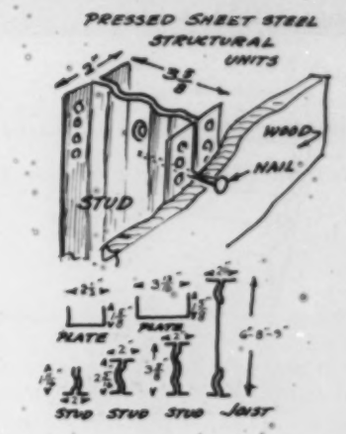
Woods

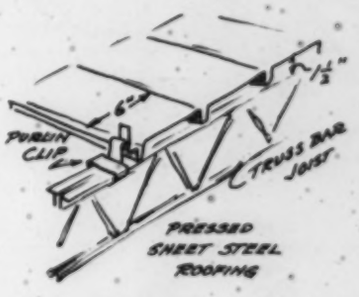
It should also be noted that special treatment for wood products makes lumber proof against insects, decay, excess shrinking and swelling, and fire.

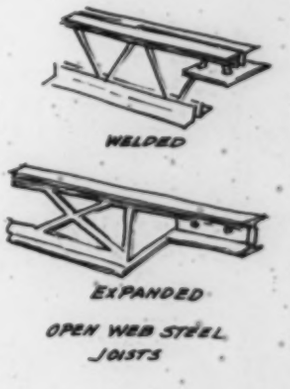
THE BUILDING PROCESS IS NOT OBSOLETE

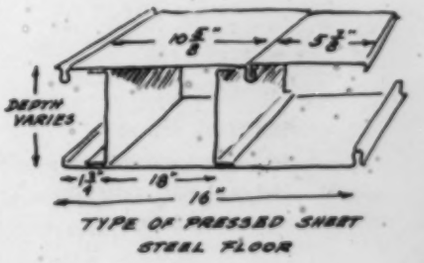
To appreciate fully the advantages of these new applications of old materials, one must first dispel another illusion that has long plagued the profession. That is that the building industry is bogged down in archaic methods, and, alone of our national industries, has sought to avoid mass-production methods. It has been said that, by and large, house construction is still a job that involves too many custom-built features and that, therefore, the average house costs too much and takes too long to build.

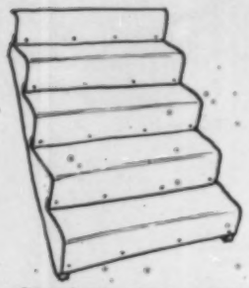
Like most long-cherished illusions, this one dies hard. But the fact is that production has been mechanized and standardization and mass production adopted in practically every department



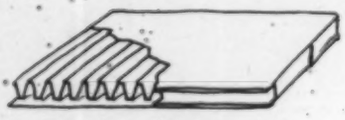




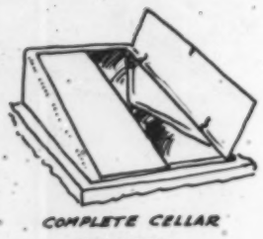




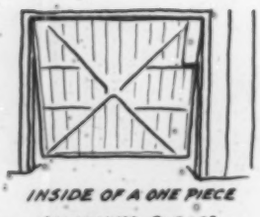
PRESSED STEEL STAIR RISERS AND TREADS MADE IN ONE PIECE MAKE A STAIRWAY WHEN PUT TOGETHER



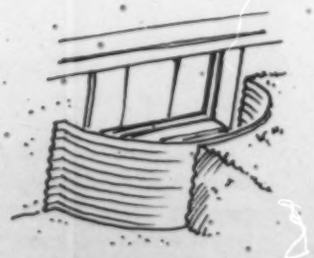
HOLLOW METAL DOOR CONSTRUCTION



COMPLETE CELLAR BULKHEAD OF PRESSED STEEL



INSIDE OF A ONE PIECE ALUMINUM GARAGE DOOR



PRESSED STEEL AREAWAY RETAINING WALLS FOR CELLAR WINDOWS

of the building materials manufacturing industry. The "industry designed house" is a reality — not just a wishful phrase. Indeed, this house is just as much a reality as the so-called prefabricated house — the difference is one only of degree. There are innumerable examples known by every architect that demonstrate the widespread use of modern methods in building construction: roofing shingles in strips; complete windows with sash, screen, storm sash, weatherstrip, trim, etc.; complete door and trim units; factory-finished cabinets and closets; precut and finished lumber; ready mixed plaster and mortar; pre-finished flooring, etc. The list is long and embraces every phase of house construction at the site. I scarcely know of any part of the construction job that is not influenced by the use of modern methods of manufacture, assembly, and materials.

Mass production differs from unit production in that unskilled operators can be used to man the machines. The skill of the designer, supervisor and artisan are transferred, under definite controls, through the medium of the factory fixture machinery and set-up to the unskilled operators — at a saving of time and expense. This principle of transfer of skills is applicable to repetitive operations; it is one of the two basic characteristics of mass production.

Second basic characteristic is the principle of interchangeability of parts. This requires that the parts be made to definite limits of dimensional error and that they fit gauges instead of mating parts. Such a procedure does not necessarily require a high degree of precision. There has been a gradual but nonetheless steady integration of standard sizes for interchangeability. Note, for instance, the standardization practices that have been accepted and recommended by the building materials associations, the Producers' Council, and the U. S. Bureau of Standards.

The order of the day therefore is coordination of the architect's planning dimensions with the 4-in. module control adopted by leading organizations in the building industry.

I believe that particularly in the small house field the architect should work almost entirely with mass-produced products having standard sizes. By so doing, he will effect economies, insure a better job, and get the house up faster.

Mass produced materials are no less beautiful, no less appealing in design than the hand-crafted products. And they are more available because they are produced in quantity.

The principal characteristics of mass-produced materials might be summed up as follows: accurate uniform dimensions; smooth, plane surfaces; straight and square edges; true geometric forms; and uniformly cut profiles.

Industry has found that certain types of surface finishing methods, such as "honing," "mechanical lapping," and "super finishing," are the most economical for mass production. The designer should regard as natural the manifestations of the mechanical processes involved, and should, accordingly, make use of them in his design, rather than attempt to copy outmoded finishes or to invent costly and ephemeral novelties.

ASSEMBLY AND TRANSPORTATION

Big scale operators like Henry Kaiser, Fritz B. Burns, and Levitt and Sons are enthusiastic practitioners of the field assembly method. They consider it cheaper to transport partly finished elements of the house and to assemble these parts on the site by organizing crews of workers who go on from one job to the next — repeating the same operations for each house.

Advocates of the prefabricated house idea believe that the standard parts should be assembled into very large units at the factory on the same principle as the straight line assembly operation pioneered by our automobile manufacturers.

The Byrne development at Baltimore shows a successful example of moving the fabricating shop to the building site.

For individual house construction, the architect has the same opportunity to use standardized parts as does the large scale operator. Chief difference in the actual construction is the matter of final assembly. Obviously, the individually constructed house is not susceptible to the economies available in assembling many units one after the other. Here, again, the difference is one of degree.

The current trend is to reduce this difference in degree by carrying standardization to the next logical step — i.e., by standardizing plan dimensions so that standard products will fit and can be installed with a minimum of labor. Thus, the individually constructed house will in reality consist largely of an assembly of many standard products.

I believe that in this evolving situation the architect who undertakes the design and supervision of houses for individuals might best serve his clients by working with the trades directly. He would then have separate contracts for each trade with his clients, and undertake the coordination, administration and the assembly of the job himself. Through such direct control he would, I believe, get a better house for his client — and at a substantial saving.

RECENT DEVELOPMENTS IN RESIDENCE HEATING

Part I: Advances in Warm Air Heating

By S. Konzo* and R. W. Roose**

WARM air winter air conditioning systems were first introduced into home heating in the early Thirties. Most of these early installations were of the conversion type in which an existing gravity warm air furnace was modified to incorporate a blower. During the past 10 years tremendous developments have been made, not only in the furnace and auxiliary equipment, but also in the method of distributing the air. Hence, a well-installed modern system will bear little resemblance to earlier installations.

Because research and practice have discovered more efficient and practical means of installing forced warm air heating equipment, there are a large number of heating contractors who now have the "know-how" to make proper installations. Tests have indicated that installation and method of operation are relatively more important than the individual items that comprise the system.

Unlike gravity warm air furnace systems, the winter air conditioning system can be adapted to a wide range of structures. The register locations may be installed high in the sidewalls, low in the walls, in the baseboard, in the ceiling, or in the floor, as shown in Fig. 1.

The greatest number of installations are made in homes having a basement. The location of the furnace-blower unit is governed only by the location of the chimney serving the fuel-burning equipment, and need not necessarily be confined to the center of the house. Nevertheless, if the architect has a choice between two locations of the chimney, an inside location is usually preferred over an outside location, to leave less likelihood of insufficient draft for removal of combustion products, and less danger of condensation of moisture in the flue gases.

Some Special Problems in Conventional Buildings

In general the heat should be delivered to the area where the greatest heat loss occurs. Furthermore, better results will be obtained by delivering the heat over a large area than by concentrating it at a single point. The following examples will illustrate the above principle:

1. To counteract the cold air leakage around an outside door, a baseboard type of register, deflecting the warm air downward toward the floor, is used. See Fig. 2 (A).

2. For locations in which cold air may come down stairways from the second floor, a counteracting stream of warm air will break up cold drafts. See Fig. 2 (B).

3. Where there is a vestibule, such as may be found in churches, the same application of a baseboard type of register is effective. See Fig. 2 (C).

4. In a normal room with one, two or three walls exposed, the goal is to blanket the cold areas with a slow-moving mass of warm air. In living rooms, two registers will be better than one. Adjustable deflecting-type registers will control the direction of the air stream in both the horizontal and vertical planes. The present trend is toward the use of high sidewall registers. These can be located so as not to interfere with furniture placement, are adaptable to future summer cooling purposes, and can be used successfully with the newer method of continuous blower operation.

5. The current trend in architectural practice of using large glass areas may require a special application of the heat source. From the standpoint of the heating engineer, the use of double glass is practically mandatory. However, even with double glass, the cold air current which rolls down the glass surfaces to the floor may attain velocities in excess of 50 ft. per minute. Even with heated

* Professor of Mechanical Engineering, University of Illinois
** Special Research Assistant in Mechanical Engineering, University of Illinois

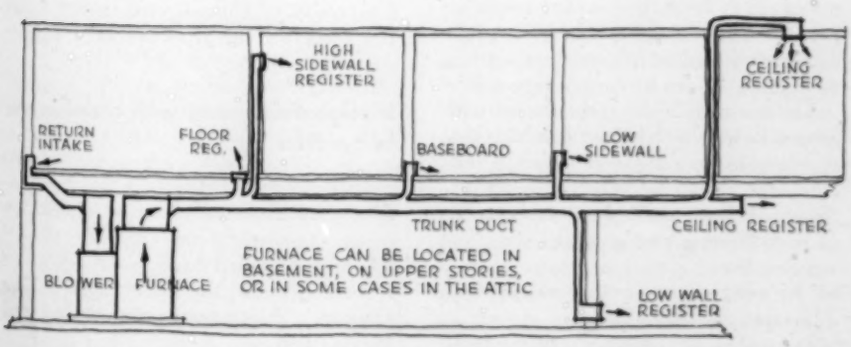


Figure 1. *With the positive circulation of a blower, the architect can assume considerable freedom in locating furnace, duct system and registers. While an inside chimney location provides better protection against condensation, it is not required for the furnace itself*

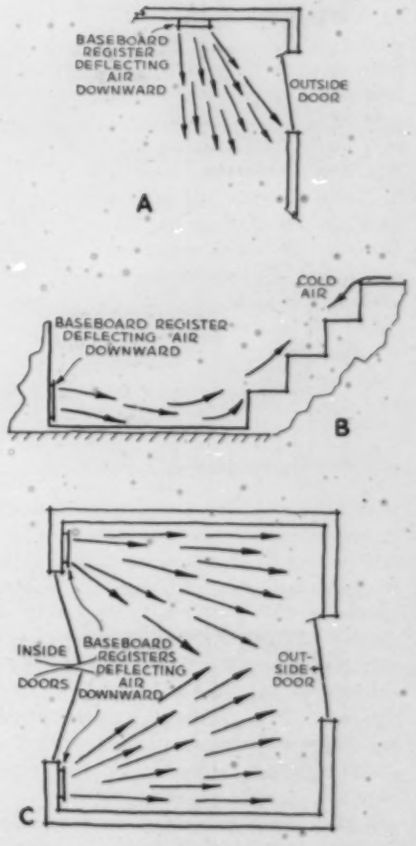


Figure 2. *Directional registers focus warm air supply to counteract drafts from an outside door (A or C) or a stairway (B)*

floor panels, this cold stream of air may extend several feet into the living zone. The most effective way to counteract it is to supply heated air upward at the window sill, floor level, or baseboard. One application is shown in Fig. 3.

Basementless type structures with floor on ground

As shown by the schematic diagram given in Fig. 4 (A) and Fig. 4 (B), the furnace is usually located in a utility room. The "highboy" type of furnace-blower unit is particularly adaptable to utility room installations, since the blower and air filters are located below the furnace heat exchanger and the entire unit occupies a small floor space. Many commercial models are available in which a completely assembled furnace is shipped from the factory; the only labor for installation of the furnace and blower is that required to connect the duct distribution system, the small copper tubing for the humidifier water supply, the electrical wires to the wiring box, and the flue pipe. A standard-width door frame is necessary in order to slide the unit through the door opening.

Fig. 4 (A) shows a common arrangement of the warm air duct system. The warm air leaves the furnace, enters the bonnet, and then spreads out in an extended flat duct which can be concealed in a furred space below the normal ceiling. The warm air registers are usually located at the high sidewall (7 ft. above the floor) or at the ceiling.

Fig. 4 (B) shows essentially the same duct arrangement except that the bonnet extends through the ceiling into the attic space. This arrangement may be less expensive than that shown in Fig. 4 (A), since a furred ceiling is not necessary, and ducts can be more easily fabricated. As the ductwork in the attic space may be exposed to cold temperatures, it should be well insulated, preferably with a 2-in.-thick batt-type insulation wrapped around the duct.

Fig. 4 (C) shows an arrangement of an attic type of furnace practically limited to gas-fired equipment. The advantages of an attic location are low installation cost, short vent flues from the furnace to the roof, and least use of floor space in the occupied portion of the house. A modification of this scheme consists of hanging the furnace below the ceiling and using the duct system shown in either Fig. 4 (A) or Fig. 4 (B). Care must be taken to use sound-absorbing pads upon which rest the furnace, and to provide for access walks for periodic inspection of the unit.

In all of the three furnace arrangements shown, the warm air supply can be delivered to the various rooms without difficulty as long as practically continuous operation of the blower is maintained. With the use of the positive pressure blower, the warm air can be delivered downward through a duct just as easily as it can be carried upward.

The main difficulty experienced with houses having a slab floor has been due to the cold floor surfaces near the outside edge of the building. Edge insulation, sub-floor insulation, asphalt tile or cork flooring on top of the slab, and wooden floors placed on sleepers, may all be used as preventive measures to alleviate cold floor effects.

One obvious solution to the cold floor problem is to use a panel-heated floor, as will be discussed in a later section. With the more conventional duct systems shown in Fig. 1, a method which has been reported to be successful is that shown in Fig. 4 (A). The return air enters a baseboard intake and into a return trunk duct that practically makes a complete loop around the outside edge below the floor slab. The conduction of heat from the air in the return trunk to the edge of the floor slab counteracts to some extent the cold floor effect.

In low-cost installations the return duct below the floor is omitted, and the return air is carried back to the blower through conventional return intakes located on inside walls close to the utility room. A cold concrete floor may result at the outer walls, and the obvious precaution is to place insulation between the foot and the slab in the form of either carpeting, wood floor on sleepers, or some insulating type of flooring material. Tests of various slab floor constructions are being planned at the University of Illinois, and results from the tests will be reported at a future date.

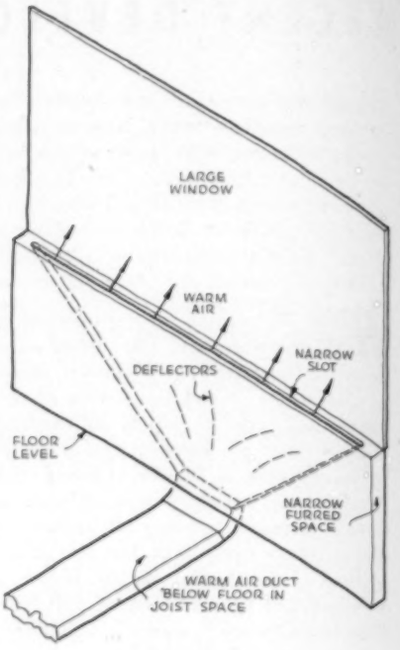


Figure 3. Introduction of air supply through slotted opening in sill counteracts draft of cold air from a large window

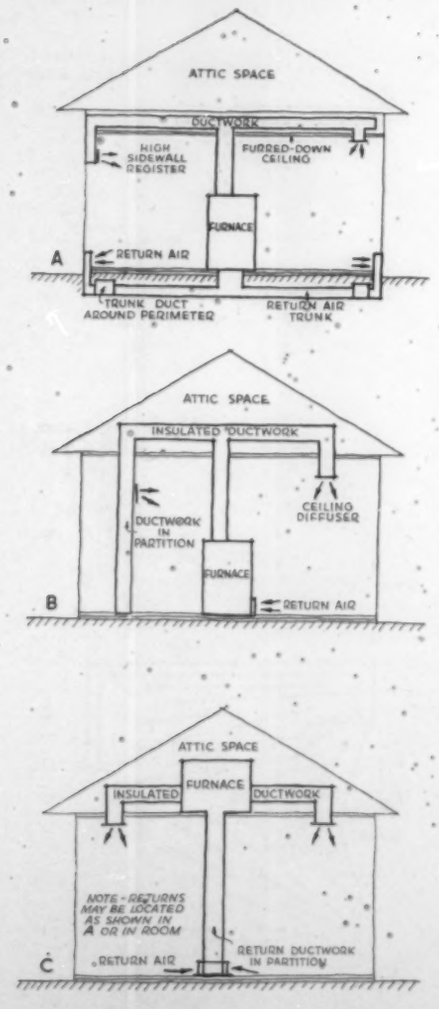


Figure 4. Three major possibilities for warm air heating systems in basementless house; the one in (C) for gas heat only

Basementless homes with crawl space below floor

In this type of structure the furnace-blower unit is usually located in a utility room, the warm-air registers served from an extended duct at the ceiling or from ducts in the attic space. The return-air ducts are commonly located below the floor.

Since crawl spaces are usually provided with ventilating grilles, which may not always close tightly, the temperature of the space may be considerably lower

than room temperatures. Insulation of the floor thus becomes a necessity.

In some low-cost installations the air leaving the room through return intakes has been allowed to discharge into the crawl space and then circulate through the space until it reaches the inlet to the blower. Any air leakage through the ventilating grilles, or around the foundation sill, is warmed by mixing with the return air from the house. Since air leakage from outdoors is not controlled in quantity, however, a greater amount of fresh air than is desirable from the standpoint of fuel economy may be drawn into the system. In addition, any dampness or dust in the crawl space may result in an earthy or musty smell. Hence, if effective utilization of the crawl space as a large return plenum is to be made, it will be necessary to: (a) provide ventilating grilles that can be closed tightly, (b) calk or seal all cracks at the foundation sill; and (c) cover the earth with concrete 1 in. or more in thickness and preferably mopped with tar to prevent ground moisture from passing through the concrete. Warm floors can be maintained with this arrangement without the use of floor insulation. Fuel costs will be higher unless the heat loss through the foundation wall is reduced by the application of insulation. The only effective means of controlling the amount of air passing through the return intakes is to provide a short stub duct below each intake and to equip it with a volume damper. Unless this is done, the air may short circuit through one or two returns and make the others relatively ineffective.

If fire-resistant material is used as flooring, it is possible to circulate heated air below the floor, and thereby make use of floor panel heating. The best procedure in this case is to use either hollow tile, or steel flooring having air passages incorporated in the material, to serve as conduits for the air flow. In order to reduce the heat loss from the heated floor to the cool crawl space, adequate insulation below the duct will be required.

Controls for the solar house

In recent years, the use of large windows on the south side, incorporating the solar orientation principle, has added a factor which seriously affects the balance of room temperatures. There are various possible ways to overcome some of the inherent difficulties:

1. Key rooms should have the same south exposure. In many cases a close control of a bedroom may not be necessary, and such a room could be located so as to have a north exposure. Obviously, the least amount of unbalance would occur if all the rooms had a south exposure, but that might not be feasible.

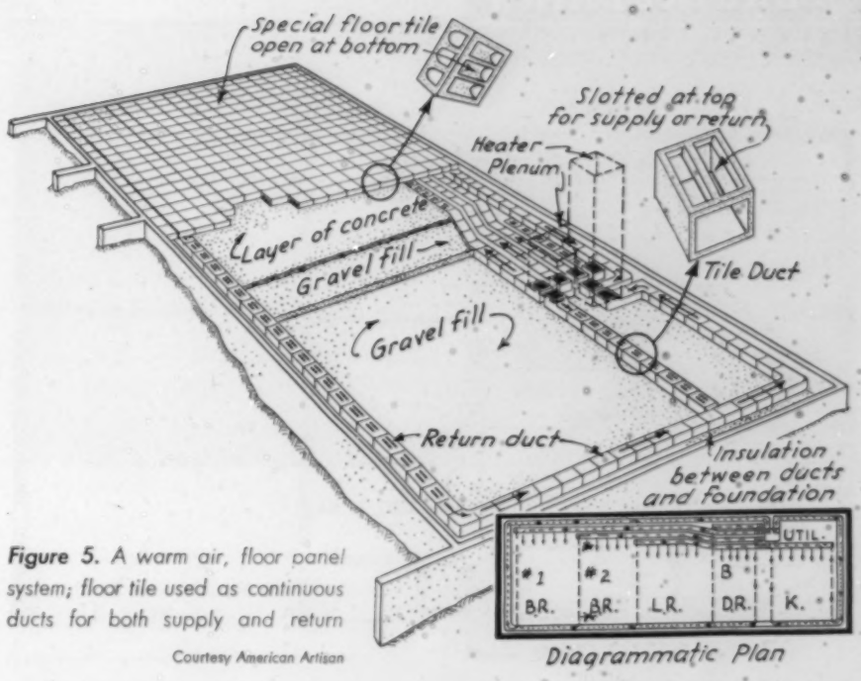


Figure 5. A warm air, floor panel system; floor tile used as continuous ducts for both supply and return

Courtesy American Artisan

2. As far as possible, it would be desirable to have the blower operate almost continuously, so that during periods of solar heating the air from the warmer rooms would mix with the air from the cooler rooms.

3. It seems desirable to locate the room thermostat at some place midway between the north and south rooms.

4. A new development in the offing, which seems to show some promise, particularly for the solar home, is a variable-volume type of register which will adjust the air supply to the room according to the heat demand of the room. When perfected, this register will give individual room temperature control without the complications of having a zone control system. In any case, such a register arrangement will require practically continuous blower operation.

Warm air systems in panel heating

In both floor and ceiling types of panel heating using warm air as the heating medium, the air is circulated in a "closed system," and none of the air enters the room. A third type of installation combines the feature of circulating the warm air in a floor panel or ceiling panel and then introducing it into the occupied zone for ventilation, humidification, and all the rest of the desirable features of winter air conditioning.

Using the floor as the panel in which the warm air is circulated is easy in the case of basementless structures having hollow tile floors, or in the case of open web steel joist construction. One application of hollow tile is shown in Fig. 5.

One of the major limitations of the floor system is the fact that output is limited by maximum floor temperature that the human being can comfortably tolerate, about 85° to 90° F.

The ceiling panel system may be applied to structures with or without basements. The panel may consist of a dropped ceiling under the existing ceiling, or it may be made up of the entire ceiling joist space if open web steel joists are used. Baffles guide the air through several passes over the ceiling. Fig. 6 shows the plan of a home that has this type of warm air radiant panel installed in the ceiling (See ARCHITECTURAL RECORD, June, 1947, pp. 137–140). This figure also shows the baffle arrangement and the path of travel of the warm air in each panel. It may be seen that there is an individual panel for each room, generally speaking, so that each room receives air of the same temperature at the start of the panel passageway. Obviously, this aids in maintaining the uniformity of air temperatures from room to room that is so highly desired.

The ceiling panel-type of installation may carry a higher surface temperature than the floor panel. Therefore the heat delivery into the room may be larger. The upper temperature limit of the ceiling surface that may be tolerated is about 110° to 115° F. for a ceiling height of 8 ft. or greater. The ceiling panel gives off about 70 per cent of its heat by radiation and the remainder by convection currents.

In the "split-system" the warm air may pass through a floor panel and then be admitted into the rooms at the outside walls under the windows or in the baseboard. Such a system is shown in Fig. 7 (See ARCHITECTURAL RECORD, June, 1947, pp. 93–95). In this installation the floor is constructed of 16-gauge steel floor panels. This com-

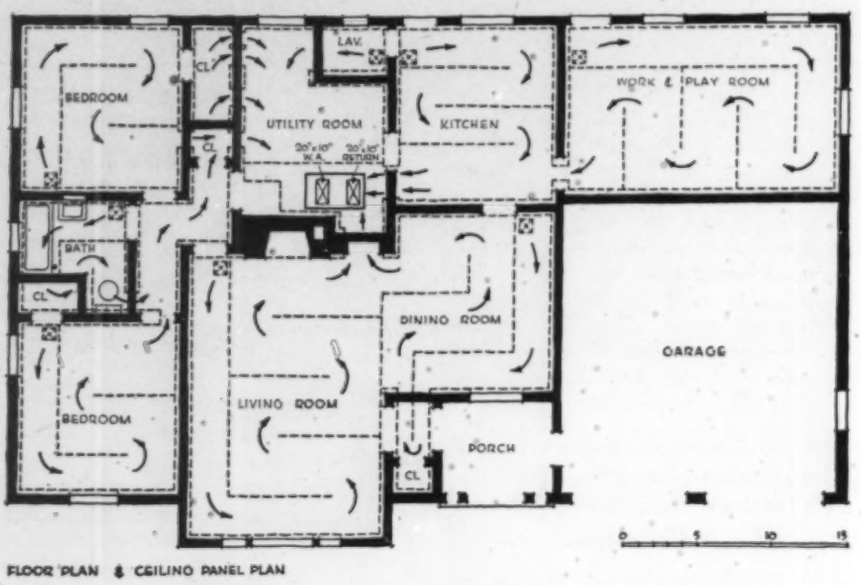


Figure 6. When the ceiling is the radiant heating panel, the whole space becomes a huge duct, baffles guiding warm air flow (see ARCHITECTURAL RECORD, June 1947, p. 93)

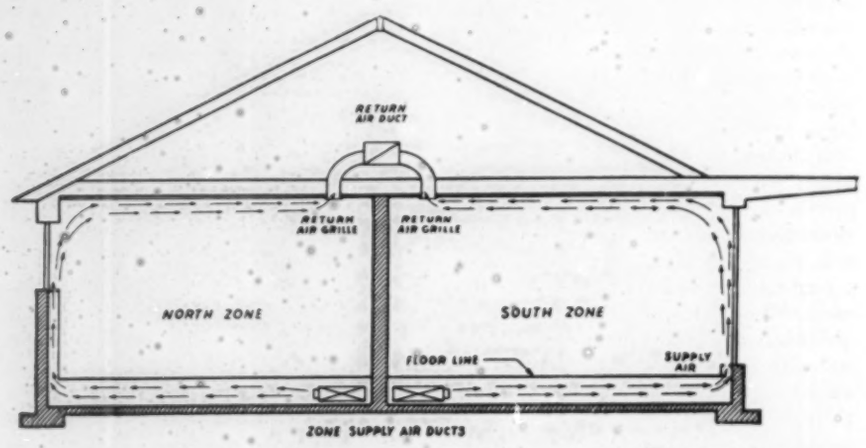


Figure 7. In the "split system" the warm air passes through a floor panel and is then admitted to the room, usually at the outside wall (see ARCHITECTURAL RECORD, June 1947)

bination of floor panel heating with conditioned air supply tends to eliminate the objectionable drafts caused by the large glass windows, at the same time producing freshness of air quality by moving the air and bringing in a desired amount of outside air for ventilation.

A similar installation using the "split-system" method has also been used in the solar house of Fig. 5. This same house has the feature of introducing some of the air into the room after it has passed through the floor panel, added after the installation had been completed. Fig. 8 shows a cross-section of the floor-tile panel and the slots near the outside walls and windows for the introduction of air into the rooms. This figure also shows some operating data taken in this home one day when the outside temperature dropped from about 9° F. at midnight to −10° F. at 8 a. m. The room air temperatures at all three levels (3 in. below the ceiling, 60 in. above the floor and 3 in. above the floor) never differed more than 2° F., through this period of drop in outside temperature.

Generally speaking, it has been estimated that the first cost of a panel heating installation is greater than that of the conventional system. Some claims have been made that the operating cost of such a system is less than for the conventional system, thereby justifying the greater initial cost. As very little unbiased research has been conducted on this subject, answers to many such questions cannot be based on factual data. The new Warm Air Heating Research Residence (Fig. 9), completed in June, 1947, to replace the first research residence, has two heating systems, which will be tested during the winter. One is a ceiling panel system that has as its panel the full depth of an 8-in. open web steel joist space. The panel has been divided into six individual panels, one for each room along the pattern of the system shown in Fig. 6. The second system is a conventional forced warm air winter air conditioning system delivering the heated air to the rooms through high sidewall registers. A direct comparison will be possible as both the panel and conventional systems are connected to the same furnace.

Operation

Tests in the older Research Residence have demonstrated that results obtained will vary from poor to excellent depending mainly upon the blower speed used and the setting of the controls.

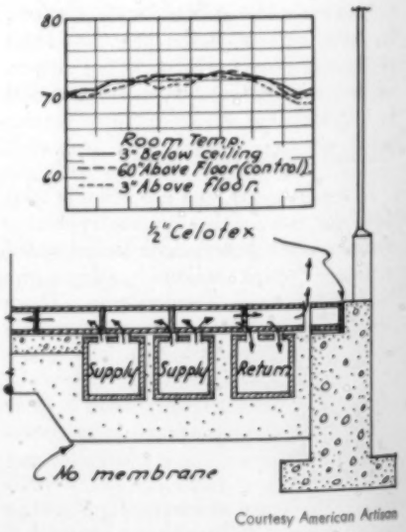
The basic rules for proper operation are as follows:

1. A building is most satisfactorily heated by a winter air conditioning system when the *blower operates for long periods* in mild weather, and practically continuously in weather colder than about 40° F. In other words, in Fig. 10 method "B" is more desirable than method "A".

2. The heat input should be so controlled that in mild weather the burner, or draft damper, operates frequently but only for short periods.

3. The blower should operate until the furnace is cooled; otherwise heated air will circulate by gravity through the nearest registers, or those highest above the furnace.

4. The ideal method of operation, therefore, is that in which the blower operates for prolonged periods and stops



Courtesy American Artisan

Figure 8. Split system using tile floor ducts, a modification of system in Fig. 5

only when the temperature of the circulating air is so low that gravity circulation becomes negligible.

The above results can be obtained if the heating contractor will make the following adjustments, which are given in more explicit terms in Manual No. 7 issued by the National Warm Air Heating and Air Conditioning Association.

1. Set the blower for the lowest possible speed to give a temperature rise of 100° F. through the furnace.

2. When all the warm air registers are at the high sidewall location, the fan switch should be adjusted to start the fan when the bonnet air temperature has reached about 110° F., and to shut off at about 25° F. lower than the starting temperature. When any warm air registers are located at the low wall, baseboard, or floor locations, slightly higher air temperatures will usually be required. The fan switch should be adjusted to start the fan when the bonnet air temperature has reached about 130° F., or slightly less, and to shut off at about 25° F. below the starting temperature.

Developments in equipment

1. *Furnace and flue.* The major trend in furnace design is toward the use of more compact units. This is particularly true with regard to gas-fired and oil-fired equipment. In hand-fired coal furnaces the trend is toward the development of the smokeless combustion units.

Lightweight flues made of Transite and vitreous enamel are available, primarily for gas-fired equipment.

2. *Standardization of ducts and fittings.* The National Warm Air Heating and Air Conditioning Association has issued Manuals No. 5 and 7, which specify the standardized sizes of ducts and fittings manufactured by the industry.

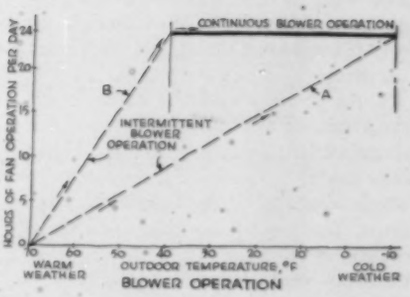
One interesting development in duct installation is the use of a uniform-sized trunk duct from the furnace to the end of the trunk. The branches may be taken off the side or the top of this extended plenum. The apparent advantage of this duct arrangement consists in ease of fabrication and improved appearance.

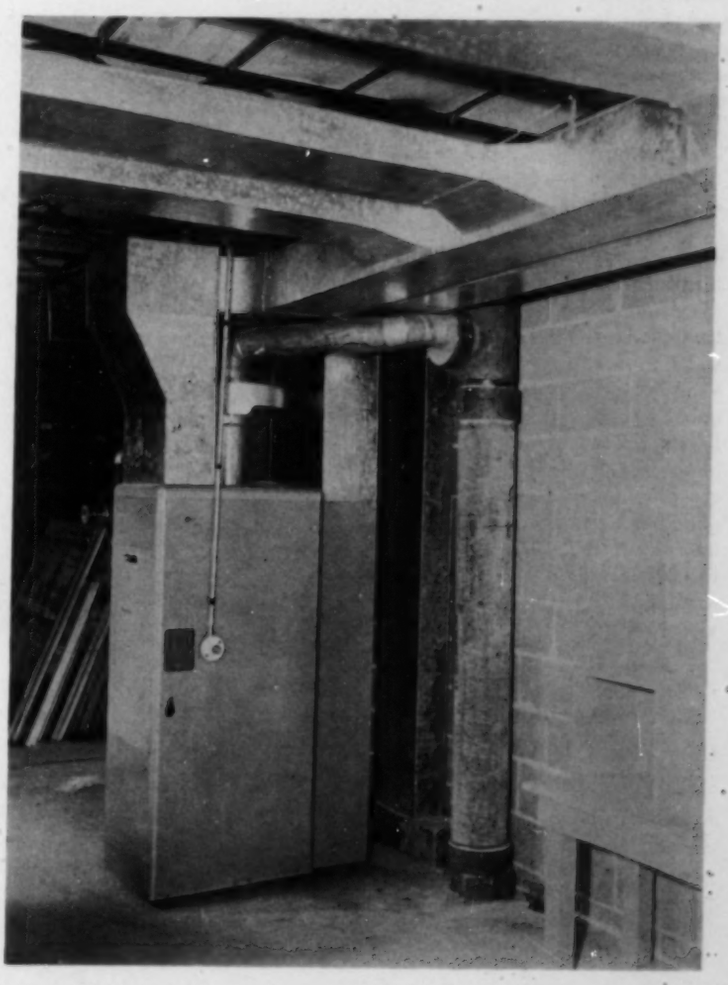
3. *Registers.* Ceiling diffusers or outlets, which were formerly made for large rooms, are now being produced in smaller sizes adapted to domestic heating. At least two companies are developing warm air registers equipped with a thermostat which will regulate the heat delivery into the room depending upon the heat demand.

From this brief survey of some of the trends and developments in warm air heating practice, it may be concluded that intensive research is being conducted toward the ultimate goal of securing a compact, low-cost, flexible unit which will cover the diverse requirements of present day home construction.

Professors F. M. Lescher and D. B. Lindsay, Architects

Figure 9, *above. The newly completed Warm Air Heating Research Residence at the University of Illinois, where comparative performance tests are beginning* ***Figure 10,*** *right. Continuous blower operation is best for cold weather; "B" is better than "A". Below: a modern forced warm air furnace, with lightweight flue and single-sized trunk supply duct*





HOUSE LIGHTING TAILORED FOR TELEVISION

HOUSE lighting becomes an increasingly important element of architectural design as a result of the growing emphasis upon built-in lighting and acceptance of fluorescent lighting to augment incandescent. A parallel might be drawn with the trend in house furnishings, away from out-of-the-moving-van pieces toward built-in cabinet work that is an integral part of the house.

Photos on this and the facing page were taken in the model rooms of the Sylvania Lighting Center in New York. While few architects will incorporate in a single house all of the lighting devices shown, the rooms are intended as a proving ground for the wide range of utilitarian and decorative effects possible when lighting is "designed-in."

Incandescent sources are not dispensed with, but the fluorescent shapes lend themselves conveniently to concealment in coves, over valances, under shelves, and behind glass panels. (For design details of similar lighting, see Time-Saver Standards, ARCHITECTURAL RECORD, May, 1947, pp. 151–153.)

Forecasting the future when television may be a feature of the average house, designers paid special attention to lighting the living room. Instead of grouping furniture around the screen, a special television set was designed with a screen that can be swung up and down or sideways to suit viewing conditions from various points within the room. Consequently some of the room occupants can follow television while others read or play cards. Low-brightness backgrounds are provided for the television screen; and "black light" units, which bring out fluorescent colors in the treated carpet, furnish minimum "safety" lighting when room is darkened for extra-clear television reception.

Living room lighting is a blend of fluorescent and incandescent: accent and general lighting furnished by built-in fluorescent lamps behind bookshelf moldings; extra light for reading from floor and table lamps that combine incandescent bulbs with the new circular fluorescents. Recessed in the mirrored wall is a lighted aquarium, providing a low-brightness background for the movable television screen. For minimum lighting when the room is darkened for special television reception, "black light" units concealed beneath cabinets and behind furniture activate fluorescent-treated carpet

(Below, left): light for reading in bed comes from a semi-indirect unit that also lights the wall above; and from fluorescent lamps concealed in glass side panels behind the shallow bookshelves. General lighting is furnished by a concealed fluorescent above the window valance. (Below, right): the combination study-office is lighted by 64-in. fluorescents concealed in the wall cove, which provide 25 footcandles of light throughout the room. The incandescent downlight recessed in the ceiling gives an extra 80 footcandles for occasional close work. The mural is edge-lighted Plexiglas

(Above, left): strong yet glareless light in the bathroom comes from the lighted column of etched glass beside the mirror, augmented by lamps concealed above the ribbed glass partitions. (Above, right): a system of direct and indirect fluorescent lighting in the kitchen gives plenty of light without shadows or brightness contrasts between work surfaces and their surroundings. Strips of concealed lamps follow the perimeter of the kitchen. Low-brightness lighting is from lamps mounted in the top of the glass-doored wall cabinets; direct lighting from lamps recessed below the cabinets

DESIGN OF WOOD BEAMS AND JOISTS

By Odd Albert, Structural Engineer

THE Wood Joist and Beam Analysis Charts on the three following Time-Saver pages have been devised as a guide for the selection or analysis of wood members for different spans and loading.

To determine what size wood joist is suitable for a certain design problem, first determine the load per linear ft. of joist, using Table I, below. It is assumed that the previously determined load per sq. ft. is evenly distributed.

Given the load per linear ft., span, maximum allowable working stresses for the type of wood contemplated (Table II), and allowable deflection (Table III), the charts will show minimum joist size that meets requirements for fiber stress in bending (Chart A), horizontal shear (Chart B), and deflection (Chart C).

Example 1: What is the minimum size joist, of Douglas Fir, Coast Type (Dense Structural), spaced 24 in. on centers, spanning 18 ft., with an evenly distributed load of 110 lb. per sq. ft.?

Using Table I, below, we find the equivalent linear load is 220 lb. per linear ft. Table II lists allowable working stresses for this type wood as 1800 lb. per sq. in. for fiber stress and 105 lb. per sq. in. for horizontal shear. In Table III, the allowable deflection for an 18 ft. span is shown as 0.60 in.

Turning to Chart A, a line can be drawn upward from 220 lb. to 18 ft., denoting the span, and projected horizontally to the right.

A line is then drawn upward from the allowable fiber stress of 1800 lb. per sq. in., until it meets the horizontal line. The joist size to the left of this meeting point, 2 by 16 in., is the minimum size that will meet this requirement.

The same procedure is then repeated with Charts B and C, using the figures for shear (105 lb. per sq. in.) and deflection (0.60 in.). Minimum joist size that will meet requirements for shear is found to be 3 by 12 in.; and for deflection, 3 by 14 in. Minimum joist size that will meet all requirements, therefore, is 3 by 14 in.

Example 2: The charts can also be used to check whether a joist of a certain size, type of wood, spacing, and span is within allowable limits for stress, shear, and deflection.

For example, can a joist, 3 by 14 in. of Yellow Pine, Dense Short Leaf, spaced 16 in. on centers, with a span of 20 ft., be used to carry a uniformly distributed load of 105 lb. per sq. ft.?

Table I shows that this load is the equivalent of 140 lb. per linear ft. of joist (interpolating between 133 and 160 lb.). On the following pages, Chart A shows a fiber stress of approximately 1052 lb. per sq. in.; Chart B, a horizontal shear of 59 lb. per sq. in.; and Chart C, a deflection of 0.59 in. Tables II and III below, indicate that these figures are within allowable limits.

TABLE I — LOAD PER LINEAR FT.

Evenly Distributed Loads in Lb. per Sq. Ft.:

Spacing	40	60	80	100	120	140	160	180	200
	Equivalent load in lb. per linear ft.:								
12″	40	60	80	100	120	140	160	180	200
16″	53	80	107	133	160	187	213	240	267
20″	67	100	133	167	200	234	267	300	333
24″	80	120	160	200	240	280	320	360	400

TABLE III — ALLOWABLE DEFLECTION

(Based on 1/360 of Span)

Span	Deflection	Span	Deflection
8′–0″	0.27″	14′–0″	0.47″
8′–6″	0.28″	15′–0″	0.50″
9′–0″	0.30″	16′–0″	0.53″
9′–6″	0.32″	17′–0″	0.57″
10′–0″	0.33″	18′–0″	0.60″
10′–6″	0.35″	19′–0″	0.63″
11′–0″	0.37″	20′–0″	0.67″
11′–6″	0.38″	22′–0″	0.73″
12′–0″	0.40″	24′–0″	0.80″
13′–0″	0.43″	26′–0″	0.87″

TABLE II — ALLOWABLE WORKING STRESSES

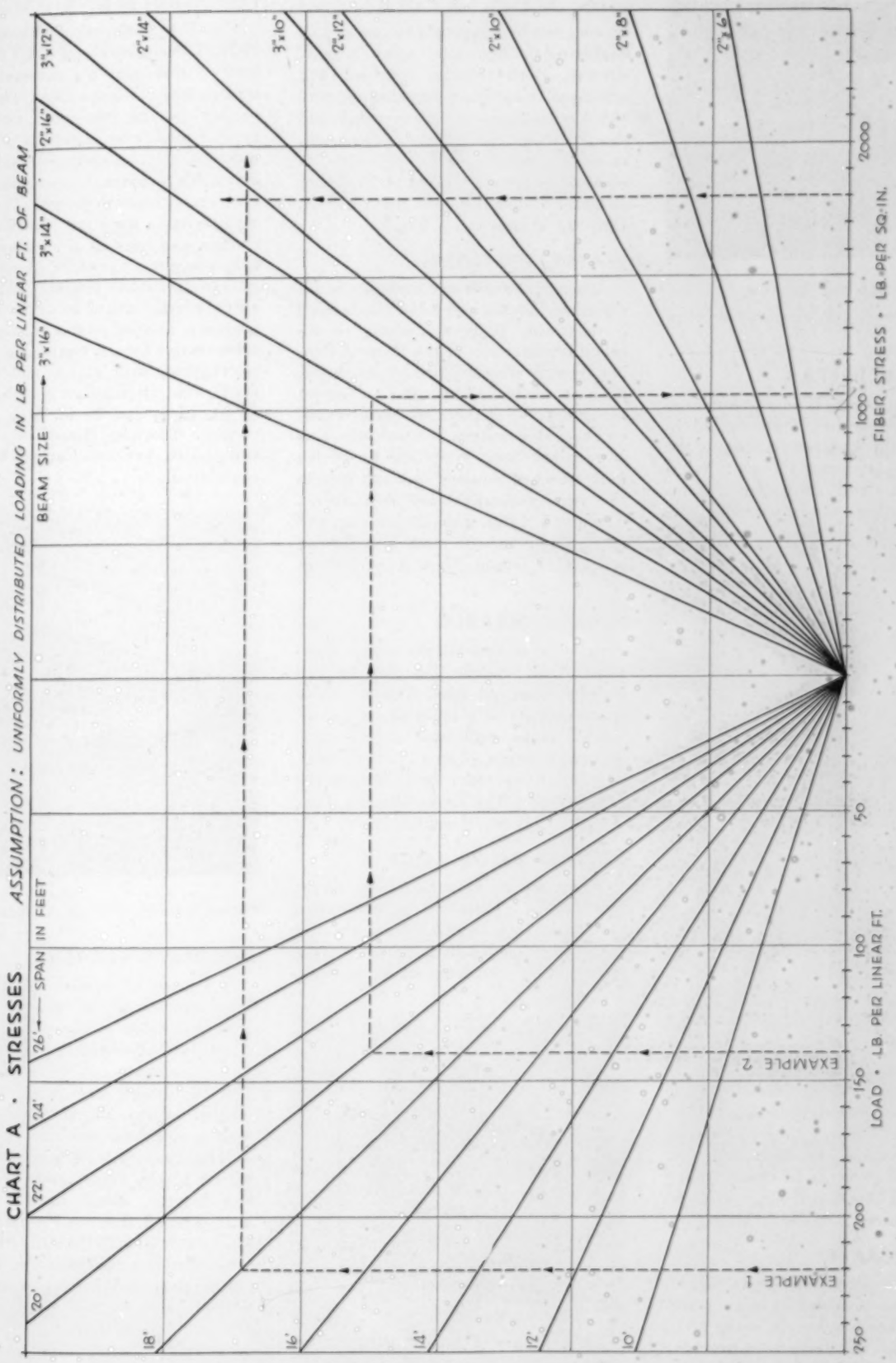
Administrative Building Code of the City of New York.
(In other localities, consult your local building code.)

Species	Grade or Quality	Bending Extreme Fiber Stress	Horizontal Shear
Yellow Pine, Long Leaf	Merchantable 1905	1600	125
" " " "	No. 1 Common	1200	125
Yellow Pine, Dense Short Leaf	"	1200	125
Douglas Fir, Coast Type	"	1200	70
Oak, Red and White	Sound Square Edge	1200	100
Hemlock, West Coast	No. 1 Common	1050	60
Cypress, Tidewater Red	Common Structural	1050	80
Redwood, California	Heart Structural	1050	60
Spruce, Red, White, and Sitka	Merchantable or No. 1 Common	1000	70
Yellow Pine, Long Leaf	Prime Structural	1800	125
Douglas Fir, Coast Type	Dense Structural	1800	105
Yellow Pine, Long Leaf	Str'l Sq. and S'nd	1600	125
Douglas Fir, Coast Type	Structural	1600	90
Redwood, California	Select Structural	1320	70

(*Continued on page 133*)

CHART A · STRESSES

ASSUMPTION: UNIFORMLY DISTRIBUTED LOADING IN LB. PER LINEAR FT. OF BEAM



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PRODUCTS for Better Building

Aluminum framing and sheathing are used in prefabricated arch-roofed structure

ALUMINUM PREFAB

The *Alumi-Drome* is an all-aluminum arch-roofed structure, first erected in quantity in the Aleutians and along the Alcan Highway during the war. Standardized units used in its system of framing and sheathing are now on the market, for general use wherever a quickly erected, weathertight utility building is needed. Size of the standard building is 36 ft. by 60 ft., but can be varied in length by multiples of 6 ft. The individual arch sections of lightweight aluminum can be raised into position after assembly on the ground, and are anchored to a concrete foundation extending 1 ft. above ground level. Longitudinal members lock into the arches to form a rigid structural framework. Sheathing sheets are flanged at both sides into channels that bolt to the framing members; ends fit into tight S-type locking members. Main arches are spaced at 6 ft. intervals; intermediate framing at 2 ft. intervals to receive the 2-ft. wide sheathing. Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

WINDOW FAN

The *Ventrola window panel fan* is reversible, motor and fan being quickly changed about in the mounting. Thus it may serve either as an exhaust fan in the kitchen or as an air intake in other rooms. It is lightweight and portable; adjustable to windows 25 to 35 in. wide; and measures 13½ in. high, and 6 in. deep. The window can be closed behind it. National Appliance Co., 4814 W. Vernor Highway, Detroit 9, Mich.

MULTI-BREAKER

Fuseless circuit breaker protection for small homes is provided by a new small-pole circuit-breaker, known as the *MO-4 Multi-Breaker*, also designed to provide a branch circuit load center for many larger installations. It combines four breaker poles that can be used as four single pole circuits, and, by insertion of tie rod, can be converted to one or two double-pole three-wire solid neutral circuits. Both thermal overload and additional magnetic protection are provided as safeguard against overloads and short circuits. It carries a 50 amp. maximum solid main rating, with individual single poles rated at 15, 20, or 30 amp. Cutler-Hammer, Inc., 439 N. 12th St., Milwaukee 1, Wis.

WATER SOFTENER

A new water softener assembly is designed for houses and small commercial installations. Daily recharging or so-called regeneration of the water softening agent is accomplished by automatic flushing, controlled by a time clock set for an hour when there are few demands on the water system. Manual attention is required once every six to twelve months, when common rock salt used in the regeneration process is replaced. The unit is 15 in. wide, 26 in. long, and 54 in. high. Auto-Softener Distributing Co., 21137 Grand River Ave., Detroit 19, Mich.

PLASTIC MARBLE

In store modernization work, *Kompolite plastic marble floor* can be laid directly upon old wood flooring. *Kompolite* consists of a layer of variegated marble chips embedded in an oxide hardened matrix over a resilient base. Metal lath separates the base from the original floor. The Kompolite Co., Inc., 111–115 Clay St., Brooklyn 22, N. Y.

KEYLESS DOOR LOCK

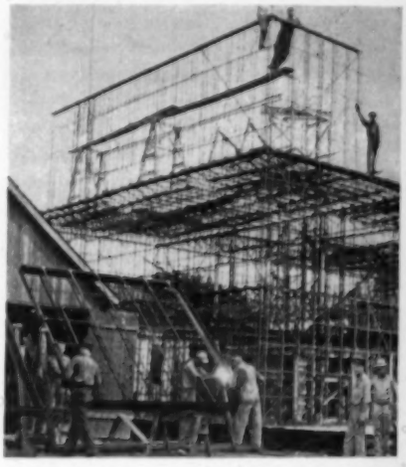
There are no keys to lose or forget with *Preslok*, a push-button combination door lock. It is locked by the flip of a lever; and opened by tapping out the combination on four small buttons.

Keyless lock is opened by combination

Installation is said to require only a straight-through cut, in any standard 1¾-in. wood door. Security Lock Corp., Walden, N. Y.

TRIPLE-DUTY SINK

The *Thor Automatic sink unit*, Model 250 CD, combines facilities for the usual kitchen sink plus an automatic dishwasher and clothes washer. The utility section can be converted into either type of washer by installing the proper unit assembly, an operation said to take only a few minutes. The assembly not in use is stored beneath the sink. The clothes washer has a capacity of 8 lb. of dry clothes, and consists of an inner clothes tub, a balancer to reduce vibration, and an agitator. After washing, clothes are automatically rinsed in cold water and spun dry. The dishwasher accommodates table service for six, contains a stainless steel drum, dish racks, and a water distributor. Dimensions are 54 in. long, 25 in. wide, and 36 in. high at work surface. Electric Household Utilities Corp., 54th Ave. and Cermak Rd., Chicago 50, Ill.



On-the-ground welding speeds construction

WELDED STRUCTURE

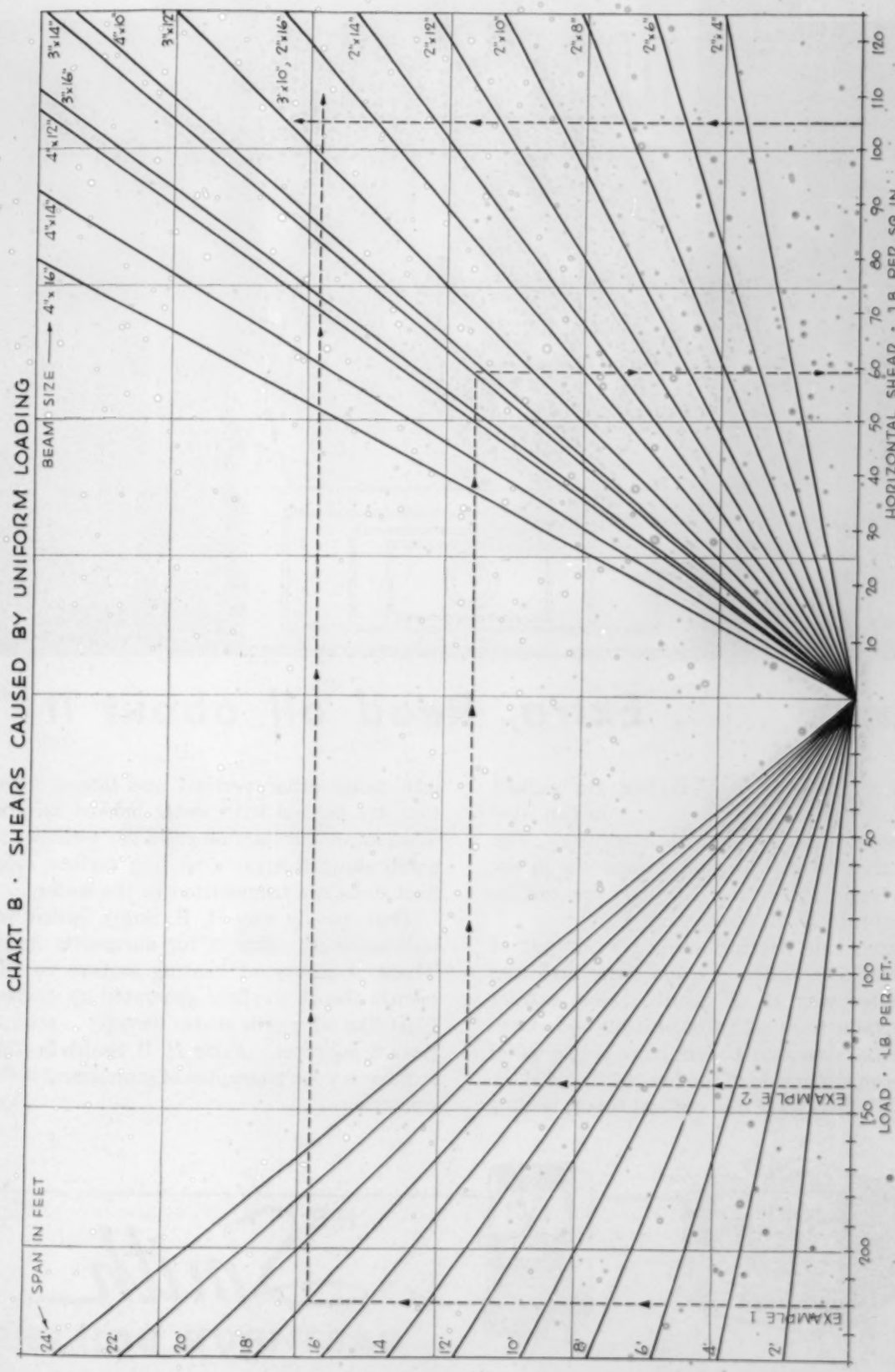
A system of welded studding, prefabricated in 10 ft. sections on the ground, is used in the construction of a light-load office building for the WKM Valve Company in Houston, Texas. The Bethlehem steel studs are lightweight, lattice-web, one-piece members with a minimum steel thickness of ⅛ in. They come in 3-, 4-, and 6-in. widths, with a 1¼-in. flange, and cut to specified lengths. When braced laterally, it is claimed they will support a safe load of at least 6000 lb. The I-beam studs are welded in a positioning jig into 10-ft. panels; then lifted into place and welded to the framework. Substantial savings in erection time are claimed for this on-the-ground method of welded fabrication. The Lincoln Electric Company, Cleveland 1, Ohio.

(*Continued on page 150*)

DESIGN OF WOOD BEAMS AND JOISTS

(*Cont. from page 129; cont. on page 135*)

By Odd Albert, Structural Engineer



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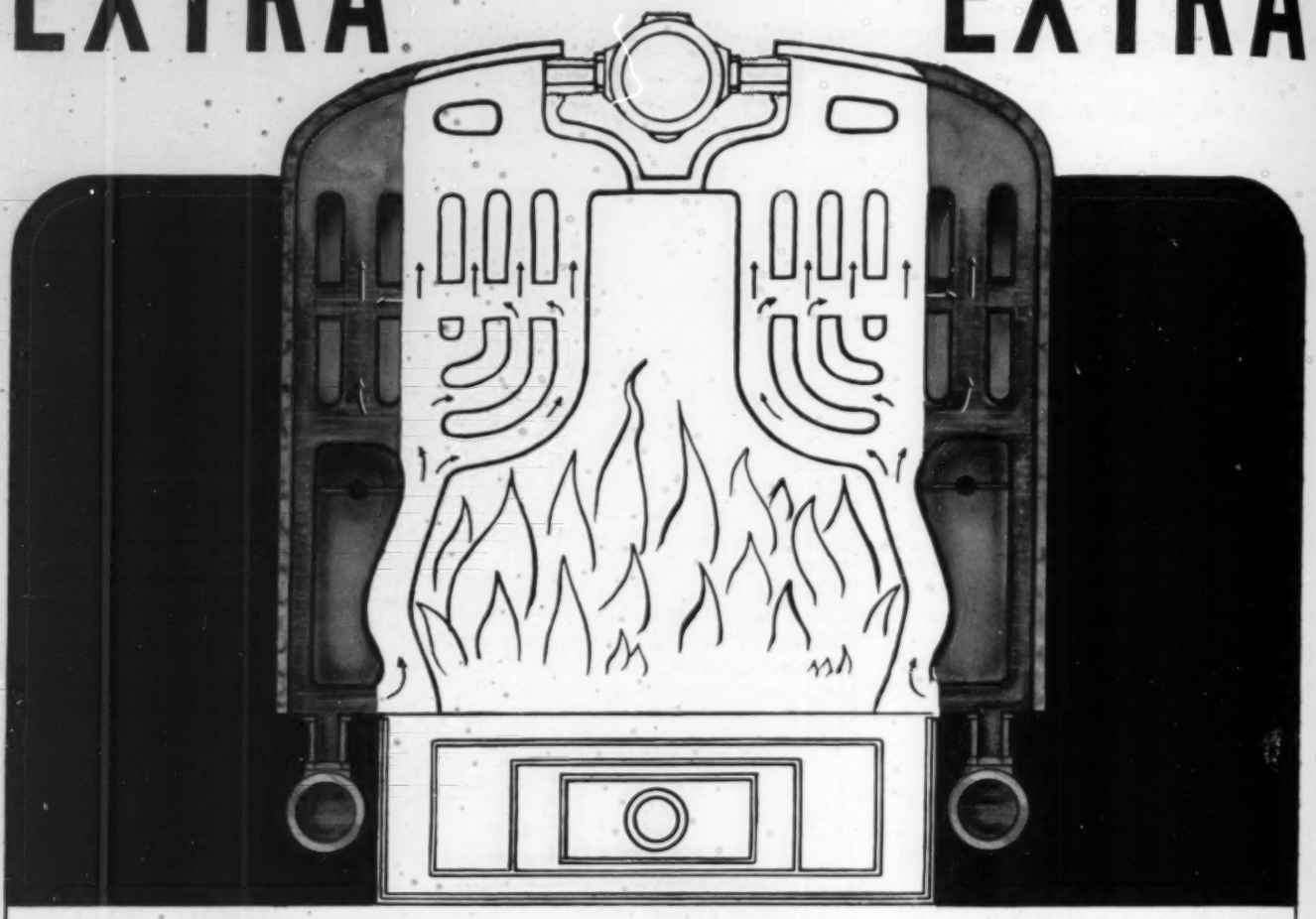
EXTRA EXTRA

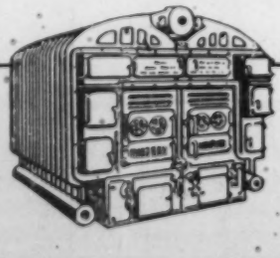


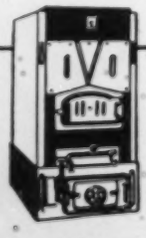
"Extra . . . Extra, Read all about it!"

H. B. Smith Cast-Iron Boilers are packed with *extra* heating surface . . . you can read all about it in H. B. Smith literature. The *extra* that means real fuel economy is in the many *more* square feet of *direct* fire surface packed into H. B. Smith boilers.

Match this heating surface with that of any cast-iron boiler of equal grate area and you'll see why H. B. Smith boilers extract more value from each fuel unit burned. Conventional cast-iron boilers have *single* water tubes on either side of the fire pot; large H. B. Smith boilers have *two* vertical tubes, leading into many other vertical and lateral tubes that are packed with water backed surface. That means all the flue gases get a chance to scrub along this *extra* heating surface, *more* heat units are transmitted to the water.

That, too, is why H. B. Smith boilers are outstandingly efficient for automatic firing. There is plenty of heating surface to efficiently absorb the heat generated by intense, blast-like oil, gas or stoker flames . . . even at peak firing rates. *Extra* H. B. Smith heating surface is your guarantee of economical boiler operation.





H.B. Smith

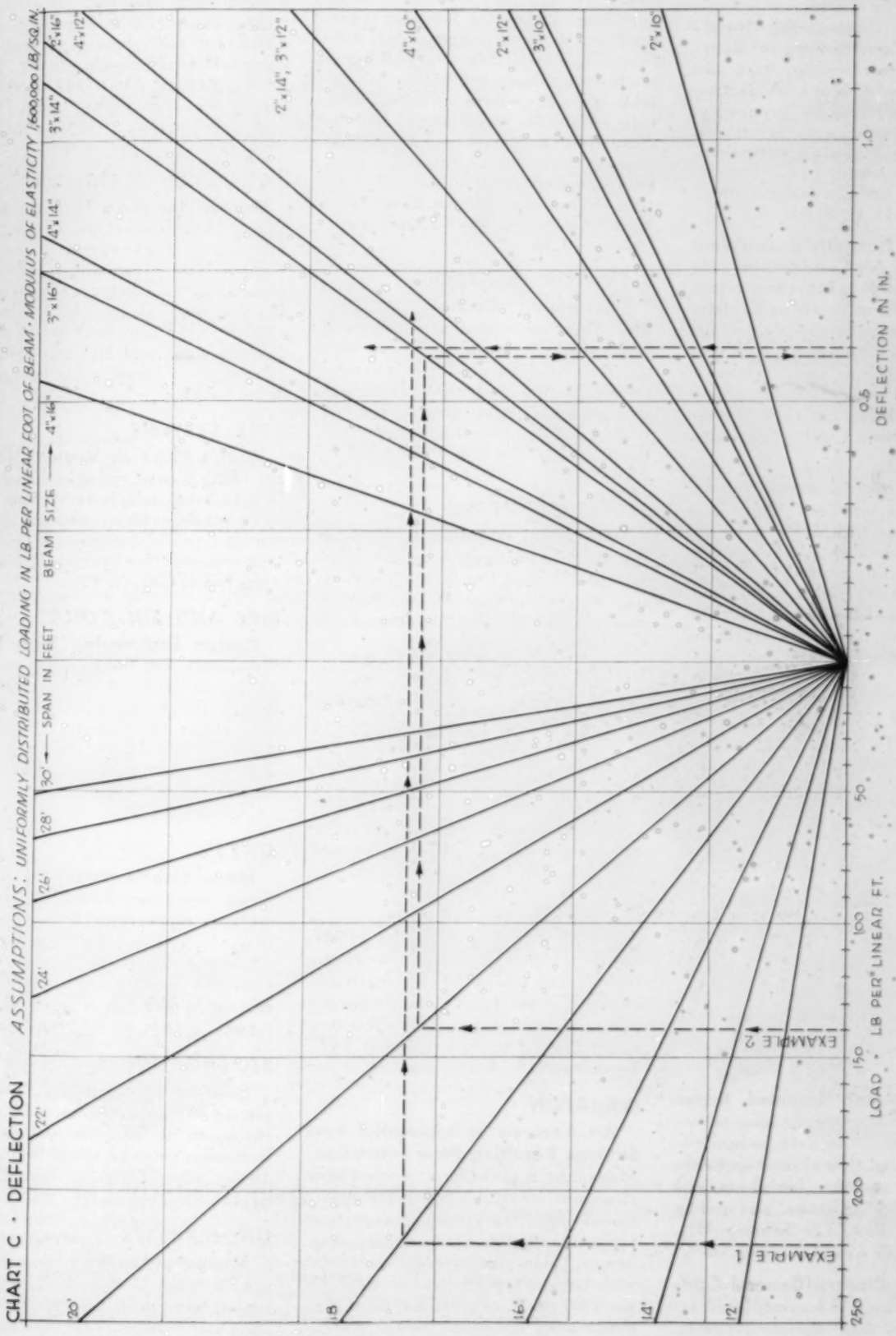
CAST-IRON BOILERS

THE H. B. SMITH CO., INC., 62 Main Street, Westfield, Mass. Offices and Representatives in Principal Cities

DESIGN OF WOOD BEAMS AND JOISTS

(Continued from page 133)

By Odd Albert, Structural Engineer



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MANUFACTURERS' LITERATURE

AIR CONDITIONING

Application Engineering Standards for Air Conditioning for Comfort. Booklet incorporating text and tables covering design load factors, ventilation and infiltration, occupancy, heat gains, transmission coefficients, air distribution, and capacity specifications. 15 pp. Air Conditioning and Refrigerating Machinery Assn., Southern Bldg., Washington 5, D. C. *$1.00.*

(1) Control Humidity if You Want Comfort From Air Conditioning; (2) Humidity Control Is More Important In Your Plant Than You May Realize. Booklets explaining operating principles and application details of the Kathabar System of Selective Humidity Control for residential air conditioning and industrial processing applications. 8 pp. each, illus. Surface Combustion Corp., Toledo 1, Ohio.*

Positive Airflow Control (Bulletin AD). Describes Aerofuse Damper No. 4 designed for use with Aerofuse Ceiling Diffuser for control of air distribution in heating, ventilating, and air conditioning systems. Engineering data gives details and dimensions of dampers, and installation instructions. 6 pp., illus. Tuttle and Bailey, Inc., New Britain, Conn.

ASBESTOS-CEMENT BOARD

Corrugated Asbestos Transite. Brochure describes physical characteristics of corrugated asbestos-cement sheet material for application to skeleton frame structures: specifications, typical applications, and cutting and fastening methods. 20 pp., illus. Johns-Manville, 22 E. 40th St., New York 16, N. Y.*

AWNING-TYPE WINDOWS

The Window of the Future. Booklet giving sizes, details, and specifications for a type of residential awning window, operated by worm and gear drive. 4 pp., illus. Gate City Sash and Door Co., Fort Lauderdale, Fla.*

DOORS

Kinnear Motor Operated Doors (Bulletin S-17). Descriptions, photographs, and mounting data for upward-acting doors and their electric operators and control stations; fire doors and shutters, bi-folding doors, and rolling doors. 8 pp., illus. The Kinnear Mfg. Co., 7000 Fields Ave., Columbus, Ohio.*

LCN Door Closers (General Catalog 11). Catalog of concealed and exposed types of door control equipment. Concealed closers for improved doorway appearance include the following types: single-acting, overhead concealed; double-acting, overhead concealed; and single-acting, floor concealed. Selector table serves as guide in selection of best type for specific requirements, such as door width and type, and method of hanging. Installation photographs, diagrams, and specification data for each type and size of door closer. 32 pp., illus. Norton Lasier Co., 466 W. Superior St., Chicago 10, Ill.

* Other product information in Sweet's File, 1947.

ELEVATOR CONTROLS

Selectomatic Controls (B-3597-5M). Brochure outlining principles of "Selectomatic" elevator operation with automatic push button selection to meet three characteristic demands of elevator service: down peak, up peak, and off peak. 8 pp., illus. Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Penn.*

FLOOR COVERING

Armstrong's Linotile: A Resilient Flooring. Architectural specifications for installation of this type of tile flooring; and instructions for the flooring contractor. 12 pp., illus. Armstrong Cork Co., Lancaster, Penn.*

HOUSE ACCESSORIES

Leigh Building Products (Catalog 47-L). Lists and describes a wide range of products for home building: ornamental shutters, dust chutes, clothes chute doors, brick and foundation ventilators, attic and roof ventilators, built-in mail boxes, and milk and package receivers. 10 pp., illus. Air Control Products, Inc., Coopersville, Mich.

PENCILS

Eberhard Faber Catalog (1947 Edition). Lists complete line of pencils, erasers, and general writing materials, including items designed for draftsmen and renderers. 46 pp., illus. Eberhard Faber Pencil Co., 37 Greenpoint Ave., Brooklyn 22, N. Y.

INSULATION

An Analysis of Residential Fuel Savings Resulting From Insulation. Manual by manufacturer of wood fiber structural insulating board, analyzing fuel savings from varying amounts and types of insulation in both 1- and 2-story houses. Tables give fuel requirements for such houses; applied costs of materials per 1000 sq. ft. of area; and method of determining combined annual cost of fuel and insulation. 10 pp., illus. Insulite Div. of Minnesota and Ontario Paper Co., 500 Baker Arcade Bldg., Minneapolis 2, Minn.*

MERCURY LAMPS

Mercury Lamps in Industry. Facts about G-E mercury lamps for lighting medium- and high-bay industrial interiors; illustrations showing typical installations; table listing physical and electrical specifications of the AH-9 (3000 watt) and AH-1 (400 watt) mercury lamps. 8 pp., illus. Lamp Dept., General Electric Co., Nela Park, Cleveland 12, Ohio.*

BATHROOM PLANNING

Modern Bathroom Plans. A collection of 34 plans developed with a threefold purpose: (1) to suggest a good plan for a family bathroom; (2) to show economical combinations of rooms and fixtures; and (3) to obtain bathroom efficiency in minimum areas. 16 pp., illus. Plumbing and Heating Industries Bureau, 35 W. Wacker Drive, Chicago 1, Ill. *10 cents.*

BELL SYSTEMS

Auth's Place in Housing (Bulletin 162.) Booklet aiding in the selection of mail boxes, telephone systems, non-electrical door chimes, and bell systems for all types of dwellings. 8 pp., illus. Auth Electric Co., Inc., 34-20 45th St., Long Island City, N. Y.

PIPE AND FIN COILS

Rempe Engineering Data Book: Pipe Coils, Fin Coils. Guide prepared for design engineers and draftsmen to help in the design of coils for heating and cooling applications, with specific data on dimensional limitations, coil development formulae, and heat transfer factors. 34 pp., illus. Rempe Co., 340 N. Sacramento Blvd., Chicago. *$1.50*

SINKS

Monel Sink Bowls. Illustrated folder giving complete details on standard seamless Monel sink bowls; specifications, blueprints, and photographs of single and double-size bowls; also, information about a cup-type sink bowl strainer. 4 pp., illus. The International Nickel Co., Inc., 67 Wall St., New York.

STORAGE UNITS

Fabricon Storage Units. Booklet depicting built-in storage units for making maximum use of walls and partitions in houses; views of actual installations. 16 pp., illus. Fabricon, 4601 E. Fifth St., Austin, Tex.

UNDERPASSES

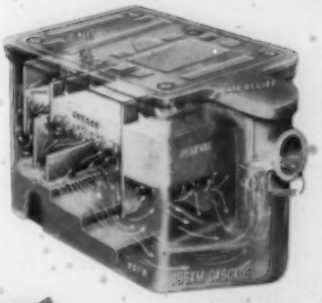
Manual of Underpasses and Service Tunnels. How to design and build underground passageways, with data on sizes and shapes of openings and avail-

(Continued on page 158)

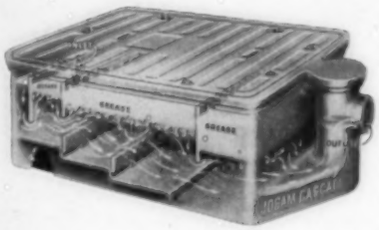
WHEN THE PROBLEM IS GREASE

THE ANSWER IS Josam CASCADE GREASE INTERCEPTORS

GREASE in waste water eventually means trouble for the plumbing system. In homes, restaurants, hospitals, hotels, and schools where GREASE is a by-product of cooking...in industrial plants, rendering plants, and packing houses where GREASE is a by-product of manufacturing, this GREASE is a costly hazard. JOSAM GREASE INTERCEPTORS eliminate this hazard completely. There is a type and size for every purpose ...so, for complete protection against GREASE problems, rely on a JOSAM GREASE INTERCEPTOR! Send for free copy of the authority on GREASE INTERCEPTION, JOSAM MANUAL "A".



Series "J" Grease Interceptor. All cast iron for Domestic and Commercial Service, capacity up to 40 GPM; for installation on floor or recessed in floor.

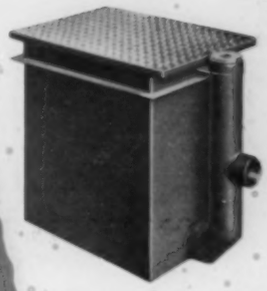


Series "JL" Grease Interceptor. All cast iron for Dishwasher Service, capacities to 30 GPM; for installation on floor or recessed in floor.

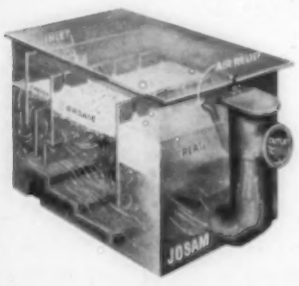
Josam

FLOW CONTROL
Guarantees
MAXIMUM GREASE INTERCEPTOR EFFICIENCY

One feature of every JOSAM GREASE INTERCEPTOR is a Flow Control to regulate the flow of waste water to the interceptor, and to assure 90% or more grease interception efficiency.

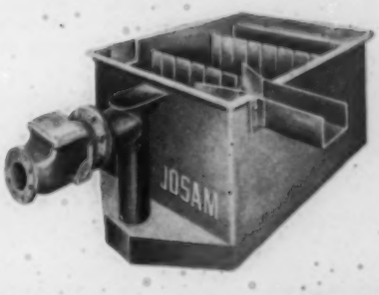


Series "JP" and "JR" Grease Interceptor. All steel for Commercial and Industrial Service, capacity up to 150 GPM; for installation recessed in floor.



Series "JN" Grease Interceptor. All steel for Commercial and Industrial Service, capacity up to 150 GPM; for installation on floor.

Series "PH" Grease Interceptor. All steel with skimming valve for Packing House Service, capacity up to 1000 GPM.



JOSAM MANUFACTURING COMPANY

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TO PROTECT YOUR PROPERTY INVESTMENT
ROUTE THIS MESSAGE TO YOUR BUILDING MANAGERS
From
THERE IS A DUNHAM PRODUCT TO MEET EVERY REQUIREMENT OF THE Heating System
Radiator Traps • Radiator Valves • Float and Thermostatic Traps • Closed Float Traps • Bucket Traps • Convectors • Control Equipment • Strainers • Unit Heaters • Vacuum and Condensation Pumps
AN EXAMPLE OF THE WAY DUNHAM ENGINEERS DEVELOP NEW WAYS OF MAKING YOUR PROPERTY PAY GREATER DIVIDENDS
DUNHAM
DIFFERENTIAL HEATING MEANS BETTER HEATING

"THERE IS A DUNHAM PRODUCT TO MEET EVERY REQUIREMENT OF YOUR HEATING SYSTEM"

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P—1147—2/3E

DUNHAM

HEATING MEANS BETTER HEATING

THE RECORD REPORTS

(*Continued from page 16*)

volving gypsum products. Price restrictions are based on an old line of patent cases freeing from Sherman Act suit products made under patent license and sold at prices fixed in the license agreements. The Department is trying to get the court to over-rule itself; if it succeeds, many building components, particularly in the fixture field, will perhaps be repriced.

Construction Studies Progress

The series of reports by President Truman's Scientific Research Board reveals construction studies in progress. The National Bureau of Standards, for instance, has under way inquiries into measurement of heat transfer of insulating materials and conductivity of selected building structure units; investigations of heating devices and systems, chimneys, air filters, and refrigerating machines; fire testing of heavy timber and mill construction and other building material including fabrics and interior finishings.

The Bureau also is analyzing paints, varnishes and lacquer, and is making a study of bituminous materials with special attention to improving asphalt-prepared roofings. It has under way as well a broad program of plumbing research, including a study of mixed air and water flow in typical plumbing systems.

The Commerce Department's Office of Technical Services has six projects primarily concerned with the development or standardization of procedures and building components to save waste and simplify building. Too, it is concerned with the Industry Engineered House, clay products standardization, lathing and plastering, tile, basement floors, spandrel wall construction, K-veneer, air conditioning, and control of weathering and moisture vapor transmission.

Other Agencies Active

Other recent developments among federal agencies include:

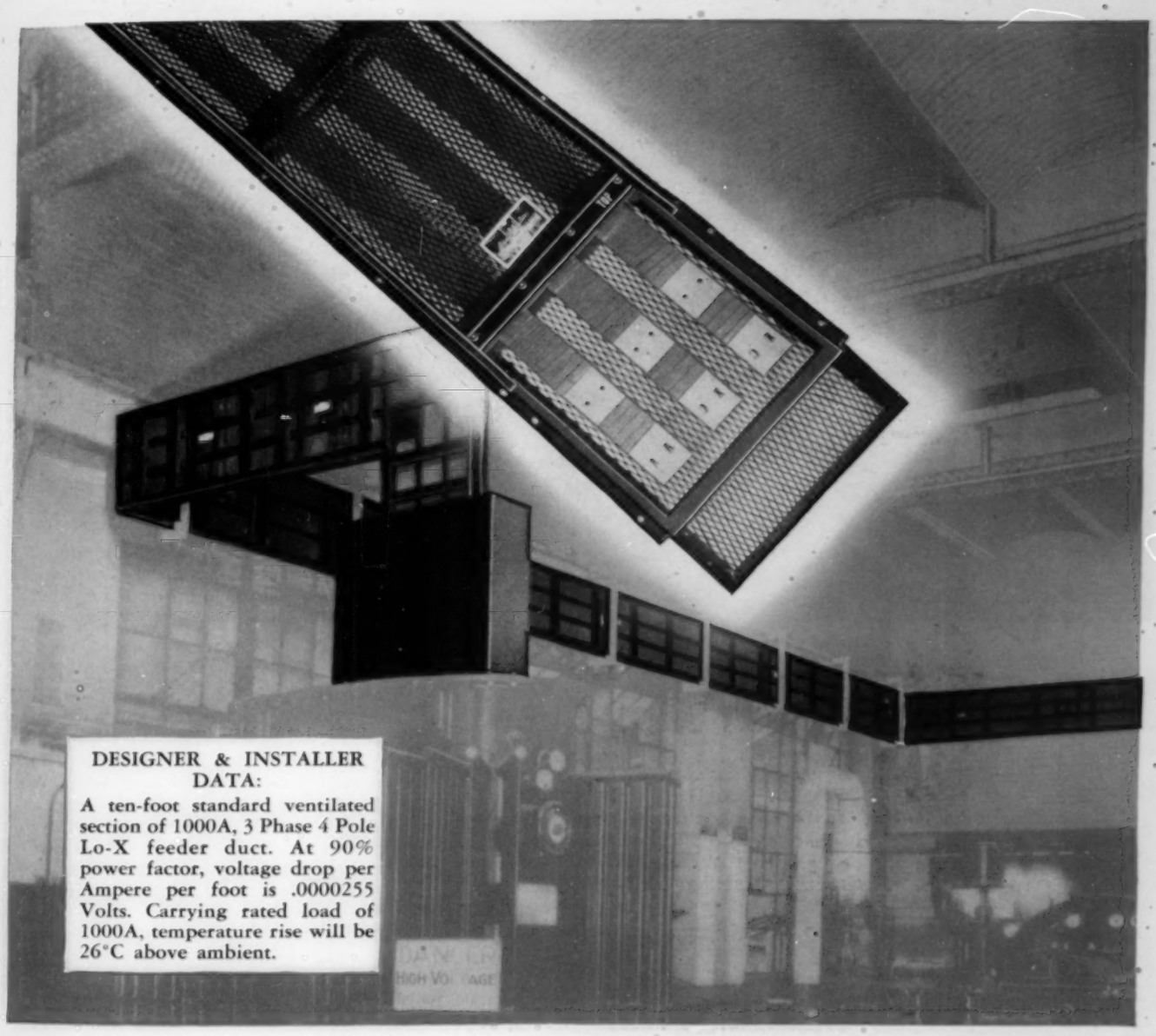
1. The Department of Agriculture announces that six new farmhouse plans "designed for modern rural living" are now available. Drawn up by agricultural engineers, architects and home economists of the Department in cooperation with state agricultural colleges, they are suitable for use in some localities in almost every region of the country. Working drawings may be obtained at the state colleges or the Department of Agriculture, Washington, D. C.

2. The new Housing and Home Finance Agency has released a new pub-

(*Continued on page 140*)

Get the drop on voltage drop

with BullDog Lo-X BUStribution DUCT



DESIGNER & INSTALLER DATA:

A ten-foot standard ventilated section of 1000A, 3 Phase 4 Pole Lo-X feeder duct. At 90% power factor, voltage drop per Ampere per foot is .0000255 Volts. Carrying rated load of 1000A, temperature rise will be 26°C above ambient.

VOLTAGE drop can be figured—and so can temperature rise—even before a feeder system is installed.

The answer to these critical power distribution problems lies in BullDog Ventilated Lo-X BUStribution DUCT. And what do these problems mean to your clients? Just this:

1. Underpowered equipment can't operate efficiently. At ten percent under voltage, induction motors have 19% less maximum running torque. And incandescent lights yield 30% less illumination!

2. High temperatures shorten the life of any distribution system and needlessly increase electrical costs.

What to do about it:

Be sure that operating voltages and temperatures are curbed to insure peak performance by specifying BullDog Ventilated Lo-X BUStribution DUCT. Unique, superior design minimizes voltage drop and temperature rise. Prefabrication makes it possible to predetermine both factors.

Call a BullDog Field Engineer for full information. Or, write BullDog direct for descriptive literature.

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BullDog manufactures Vacu-Break Safety Switches—SafToFuse Panelboards—Superba and Rocker Type Lighting Panels—Switchboards—Circuit Master Breakers—"Lo-X" Feeder BUStribution DUCT—"Plug-in" Type BUStribution DUCT—Universal Trol-E-Duct for flexible lighting—Industrial Trol-E-Duct for portable tools, cranes, hoists.

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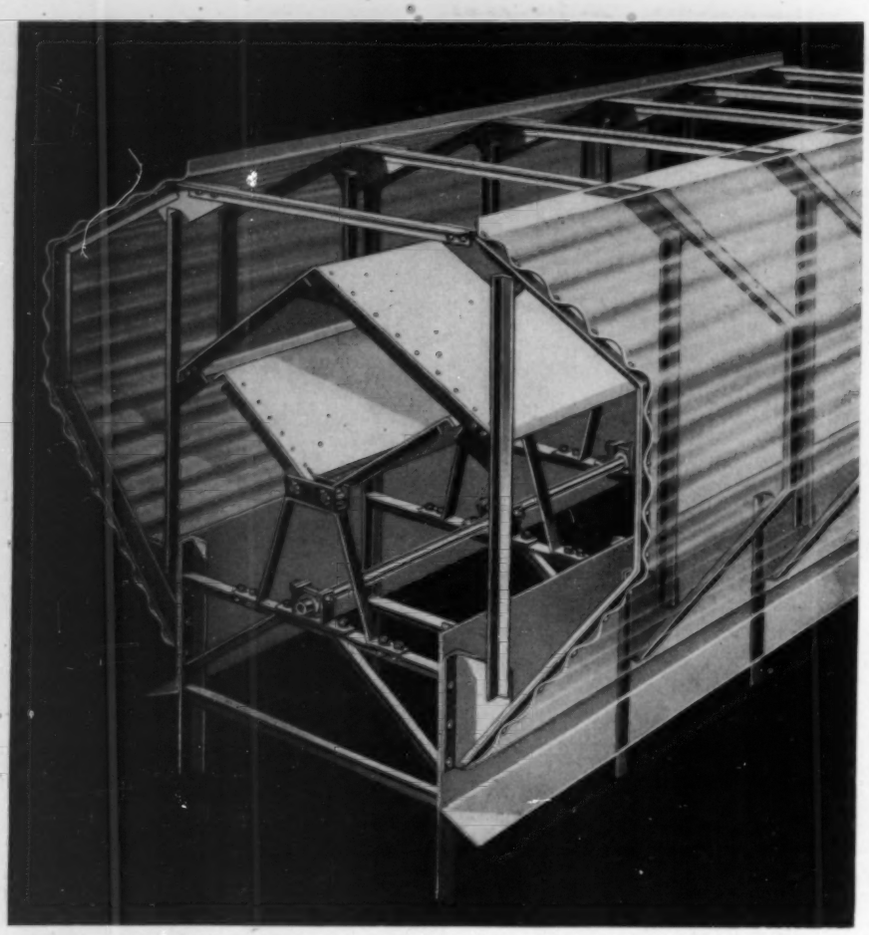
ADEQUATE WIRING SERVES AND SAVES

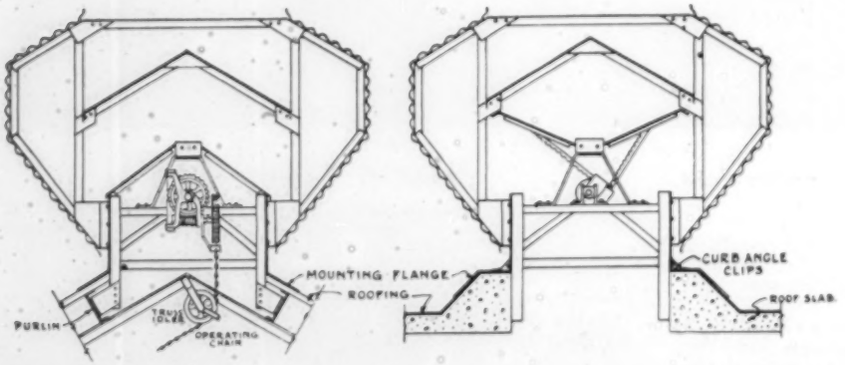
BULLDOG

ELECTRIC PRODUCTS COMPANY



SPEED PRODUCTION WITH THE ECONOMICAL BURT MONOVENT

This highly efficient ventilator may be installed on any type roof to exhaust heat, smoke and fumes the entire length of the building. Its simplicity and heavy construction assure extremely long, trouble-free life with practically no maintenance expense. The Burt Monovent may be the solution to your ventilating problems. Write Burt—now—for further details.



TYPICAL MOUNTING FOR PITCH ROOF. Showing Damper closed and Operator Control.

MOUNTING FOR CURB ROOF. Showing Damper open with Rack and Pinion Operators.

WRITE FOR CATALOGS AND DATA SHEETS

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VENTILATORS • LOUVERS • OIL FILTERS AND SHEET METAL SPECIALTIES

THE RECORD REPORTS

(*Continued from page 136*)

lication, "Performance Standards," to provide a uniform basis for measuring the adequacy of building materials and home construction methods. It proposes performance standards for structural elements such as floors, walls, partitions, ceilings and roofs, and deals with insulation requirements.

3. The U.S. Tariff Commission has issued a report on softwood lumber in its series on War Changes in Industry, prepared at the request of the House Ways and Means and the Senate Finance Committees. It makes the following pertinent comment: "The war has left behind a situation which will greatly influence the lumber industry at least for some years to come. Limitation of civilian construction during the war built up a huge backlog of demands for residences; in addition, railroads, farms, and manufacturing plants of all kinds will for some years require much more softwood lumber than they used before the war. From the standpoint of the long-term public interest, the United States will face an increasingly important conservation problem as a result of the heavy drain on United States forests which will be required to supply the postwar demand."

❖ ❖ ❖

ON THE CALENDAR

Sept. 17–Nov. 23: Exhibits, "The Architecture of Mies Van der Rohe" and "One Hundred Useful Objects of Fine Design," Museum of Modern Art, New York.

Nov. 9–14: 40th Convention, National Association of Real Estate Boards, San Francisco, Calif.

Nov. 10–13: 25th Annual Convention, The American Institute of Steel Construction, Inc., Roney Plaza Hotel, Miami Beach, Fla.

Nov. 10–29: Exhibition of paintings by Lillian Dubin and sculpture by Wolfgang Behl, Bertha Schaefer Gallery, 32 E. 57th St., New York City.

Nov. 17–20: 14th Annual Meeting, National Association of Housing Officials, Hotel New Yorker, New York.

Nov. 19–23: Louisiana State Housing Exposition, Louisiana State University Agricultural Center, Baton Rouge, La.

Nov. 22–Dec. 4: Scalamandre Exhibition (textiles), School of Architecture and Allied Arts, University of Oregon, Eugene, Ore.

Dec. 1–27: Group Show of Painting, Sculpture and Pottery, Bertha Schaefer Gallery, 32 E. 57th St., New York City.

Dec. 2–5: Annual Meeting, American Society of Mechanical Engineers, Chal-

(*Continued on page 142*)

He puts the Name before the number

This man is a wise and experienced planner. He is recommending switches for a client's new building. Because he *is* wise and experienced he says "G.E. 2841."

That number represents to him (and to thousands of other architects and builders) a fine-quality switch with outstanding features of construction that will assure long, efficient service on practically any job.

But the name represented by the G.E. *before* the catalog number means a lot more to him. It means engineering skill, manufacturing ability, a reputation for quality. It means General Electric, a leader in the electrical industry. And it means satisfied clients.

This man (and thousands like him) knows that whether he is specifying switches or outlets, fuses or fluorescent accessories, sockets or other wiring devices, he can say General Electric with confidence in his own judgment.

If you have been content to specify merely "wiring devices," take a tip from a great many satisfied users, and specify "General Electric Wiring Devices" from now on. Your clients will respect your preference for the brand that gives them long-term satisfaction.

WIRING DEVICES by

GENERAL ELECTRIC

say "G.E." and he'll agree

Wiring Briefs from your G-E Distributors

Are you familiar with the great variety of products in General Electric's full line of wiring devices? Do you know the interesting features that help to make them easy to use and safe to specify? Keep an eye on this column, and you may discover a lot of useful facts and information. We'll keep dishing them out for you.

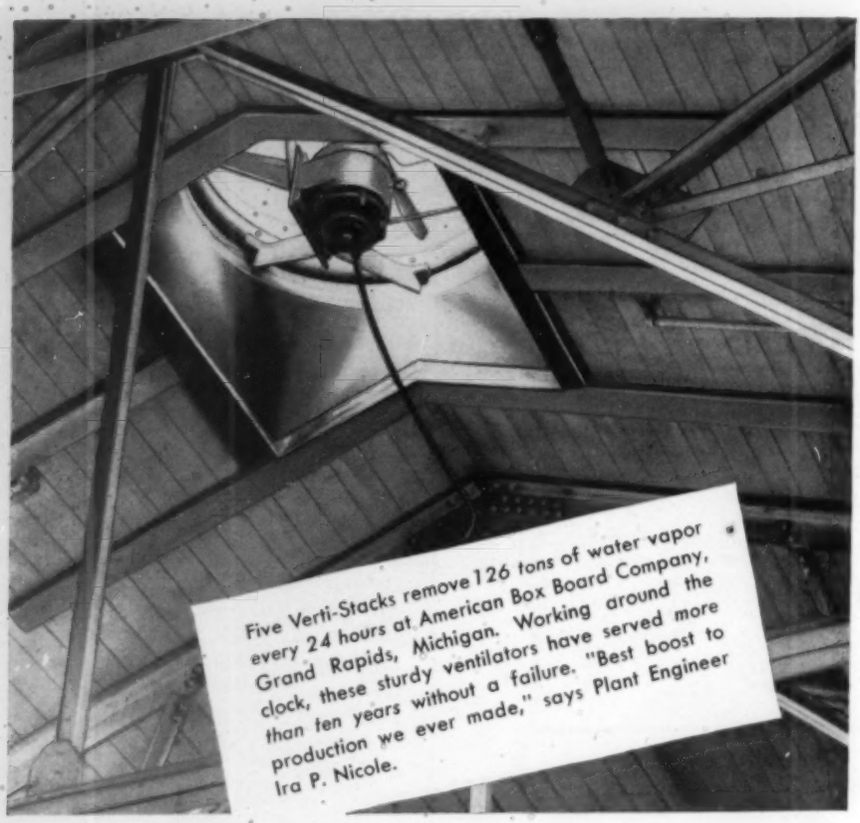
When you're planning for farm buildings, summer camps, warehouses, garages and other light construction, remember that General Electric makes a full line of surface wiring devices that is easy to install and that provides long service. The line includes switches, convenience outlets, lampholders, and junction boxes. All are strongly made, light in weight, and resistant to moisture and corrosion. Use them for BX* or Braid-X* cable installations, or for knob and tube wiring. All General Electric surface wiring devices are fully approved by the Underwriters' Laboratories, Inc. Ask us for a descriptive folder.

Permanent, weatherproof protection for outdoor lighting is provided when you specify or use General Electric's flush outdoor outlets. A rubber mat under the plate, and a special protecting cap for the outlet connection keep rain and moisture out of the box. These specially-designed devices are recommended for patios, breezeways, and other inside or outside locations where installations may be subject to excessive moisture. Other special outlets for clock and telephone connections are also available.

It's easy to add an extra flourish to your residential wiring plans. General Electric combination devices will please your clients, and will give them a touch of "something special" that they'll remember and appreciate for years to come. There are many such devices in the big G-E line. Here are a few typical examples, to be specified as your client's requirements suggest: (1) flush switch, convenience outlet, and pilot light; (2) switch or outlet, with pilot light; (3) radio and convenience outlet combinations. There is a variety of other combinations.

If you want additional information on these, or other G-E Wiring Devices, ask us — your General Electric Merchandise Distributor — or write to Section D-62-115, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut.

**Trade-mark Reg. U. S. Pat. Off.*

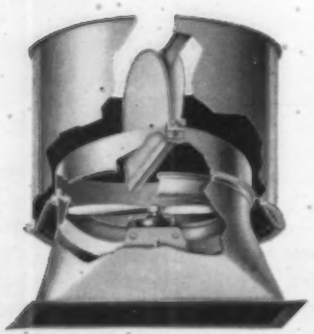

Five Verti-Stacks remove 126 tons of water vapor every 24 hours at American Box Board Company, Grand Rapids, Michigan. Working around the clock, these sturdy ventilators have served more than ten years without a failure. "Best boost to production we ever made," says Plant Engineer Ira P. Nicole.

VERTI-STACKS

GIVE POSITIVE AIR CIRCULATION

When you're designing factory ventilation, give your clients the many notable advantages of Propellair Verti-Stacks. Powerful suction exhausts dust, fumes, moisture, and heat high above the roof . . . pulls in clean air at worker level . . . *boosts plant productivity.* And in hot summer weather, Verti-Stacks operated during the night *quickly sweep the entire building* with fresh, cool air—leave it *right* for a vigorous morning start.

Scientifically designed



Butterfly dampers open and close automatically; offer negligible resistance to high-volume, high-velocity air flow.

Propellair ventilating equipment is based on *proved engineering principles.* Airfoil section fan blades *pull* as they *push*, like an airplane wing—evenly distribute the load from tip to hub. Tireless . . . highly efficient . . . *job-proved* on countless applications. Types, sizes, and mountings meet all needs. For roofs, walls, windows, ducts, and with floor stands or pedestals. Let us send you full details.

PROPELLAIR

DIVISION OF ROBBINS & MYERS • INC.

SPRINGFIELD • OHIO

THE RECORD REPORTS

(*Continued from page 140*)

fonte-Haddon Hall, Atlantic City, N. J.

Jan. 10–29: "Arts of Early People," exhibition from the anthropology collection of the University, School of Architecture and Allied Arts, University of Oregon, Eugene, Ore.

Jan. 12–16: 2nd National Materials Handling Exposition, Public Auditorium, Cleveland, Ohio.

Jan. 26–29: 5th All-Industry Refrigeration and Air Conditioning Exposition, Public Auditorium, Cleveland, Ohio.

CONSTRUCTION IS UP

Sharp gains in contracts awarded in August for construction in the 37 states east of the Rocky Mountains were reported by the F. W. Dodge Corp. Total value of the contracts awarded was the highest since the postwar peak attained in May, 1946, and was greater than the total for either June or July of this year, establishing a significant and uniquely heavy upward trend.

The August total was 25 per cent greater than that for July, and 21 per cent greater than that for August last year. This increase was sufficient to reduce the eight months' comparison with the corresponding period in 1946 to a loss of only 7 per cent from the 11 per cent decrease shown at the end of seven months.

The August volume of contract commitments was higher in all major classifications of construction than in July or in August of last year. Nonresidential building showed a gain of 15 per cent over July and 37 per cent over August, 1946. Residential volume was up 28 per cent over July and 9 per cent over August of last year, while public works and utilities contracts showed gains of 35 per cent over July and 21 per cent over August of 1946.

PRODUCERS' COUNCIL MEETS

Building volume is on the upgrade, costs are stabilizing, materials shortages are disappearing, the productivity of labor is improving, building time is being shortened, and the quality of new building is getting back to normal. Such was the encouraging picture painted by David S. Miller, newly elected president of the Producers' Council, at the Council's annual meeting held in New York last month.

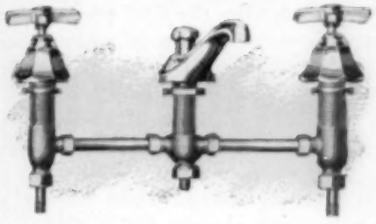
"That is the picture which our industry must start telling to the public," said Mr. Miller. "Instead of spending our time answering those who for one reason and another have been critical of the building industry, let's tell the story of our rapid recovery. Let's tell

(*Continued on page 144*)

Salter MASTERPIECE LAVATORY FIXTURES add distinction on every Installation

671 right—Masterpiece Center-Set Lavatory Fixture for 4" center openings with code spout having anti-splash attachment. Complete with the new easy to install Salter snap-lock pop-up waste. The graceful appearance of this fixture is accented with metal Art Line handles and all exposed parts are polished chrome finish. Long life "EZE" close valve construction assures years of trouble free service. One piece specification ingot body complete with ½" I. P. S. shanks, ¼" I. P. S. tailpieces, tailpiece nuts and lock nuts. 1¼"x4" waste tailpipe.

670 Same as 671 less pop up waste but with bead chain and hard rubber stopper.



367 above—Masterpiece Lavatory Fixture has 12" three piece body with copper tube valve connections which are easily adjustable to fit 3 opening lavatories with holes in line or offset. Four arm metal indexed handles, code spout and new, easy to install, snaplock pop-up waste. All exposed parts are polished chrome finish. Renewable "EZE" close seats with inverted stuffing box valve construction.

371—Masterpiece Lavatory Fixture with Art-Design indexed handles and complete with snap-lock pop-up waste. Long life "EZE" close valve construction. For lavatories with 4" center openings. ½" I. P. S. shanks, ¼" I. P. S. tailpieces, with tailpiece nuts and lock nuts.

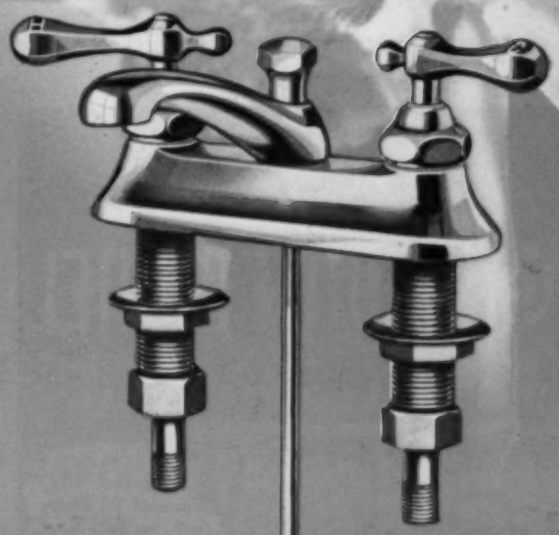
258D above—Regular Code Pattern Lavatory Faucet with four arm metal handle, snap-on index. Polished chrome finish.

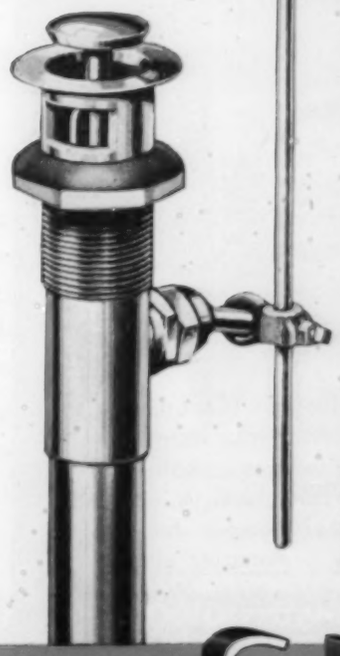
458 left—Two Piece Basin Plug with 2" flanged top, bevelled edge. Complete with bead chain, hard rubber stopper and washer. 17 gauge chrome plated 5" brass tailpiece.

COMING SOON . . . a new line of faucets to tickle your sales.

Beautiful in any setting

AND UNEXCELLED FOR "EZE" CLOSE SERVICE





To add that extra touch of appearance and distinction to any lavatory installation, specify Salter Masterpiece Fixtures. A variety of patterns including the 4" centerset fixture above with full code spout, also adjustable three piece fixtures on 12" centers, makes it possible to please every customers' individual tastes. Plumbers will tell you that the improved Salter snaplock pop-up waste with its foolproof positive action is unparalleled for easy, time saving installation. All patterns are also available less waste but with bead chain and stopper. To become more familiar with the variety of available lavatory fixtures, faucets, drains etc., write today for the new Salter Deluxe Catalog. It will also acquaint you with the many other exclusive Salter fixtures for the bath, kitchen and laundry. You will quickly see why Salter "Masterpieces in Brass" are today's quality fixture line.

H.B. Salter MFG. CO.

MASTERPIECES IN BRASS

10 Ninth Street, Marysville, Ohio

and division THE GLAUBER BRASS MFG. CO., *Kinsman, Ohio*

the public how we have overcome our handicaps and, one by one, have solved or made a fine start on solving, our problems. We have real accomplishment to hold up before the American people."

Among other speakers at the two-day meeting and exhibit of new building products was George N. Thompson, assistant chief of the Building Technology Division of the National Bureau of Standards, who reported progress in the modernization of local building codes as a result of the growing acceptance of standard code provisions developed by building code officials. Tyler S. Rogers, retiring Council president, commented that the greatest contribution which the federal government can make in the field of housing and construction is to help the building industry speed up the adoption of modular coordination and the principles of the Industry Engineered House program. "These projects will do more to lower buildings costs," Mr. Rogers said, "than anything else which is being proposed today. At the same time, both projects mean better quality in construction."

Blodgett
FIRST AGAIN WITH MONEL
Ovens
The No. 959, one of 22 Blodgett models now also available in Monel
Now you can buy Blodgett's De Luxe No. 900 Series ovens in #35 MONEL, including complete exterior and all interior surfaces normally subject to corrosion (except shelves). This gleaming, polished metal adds to Blodgett's other famous features: Longer life Greater beauty Amazing cleaning ease Freedom from service worries. Write today for descriptive folder.
THE G. S. BLODGETT CO., Inc.
50 LAKESIDE AVE. BURLINGTON, VERMONT

MILD RECESSION IN '48?

A mild business recession beginning next spring was predicted by the majority of 100 economists polled recently by F. W. Dodge Corp.

Seventy-five of the economists expected a recession in 1948, 21 did not, and four expressed no opinion. Of those predicting the recession, 41 believed it would be mild, 19 expected it to be "moderately serious," and 11 "serious." There was a wide division of opinion as to when it would begin, but February and March were most frequently mentioned.

Despite this general expectation of a business recession, the majority of the group polled anticipates a greater dollar volume of construction contracts in 1948 than this year's. Industrial production is expected to remain stable or decline from the 1947 level, and employment is foreseen as approximately stable to lower in 1948 as compared with this year. The index of wholesale commodity prices as established by the U. S. Bureau of Labor Statistics is expected to continue to rise through December, but to be down by August, and down further by the end of 1948.

NEW COMPETITION

The Second Annual Sign Design Competition, offering a total of $1000 in cash awards, has been announced by the National Electric Sign Assn. Four awards and six honorable mentions will be given for the best electric sign designs submitted as a solution to the problem presented in a photograph of a corner drug store. For further particulars, address National Electric Sign Assn., 224 S. Michigan Ave., Chicago 4, Ill. The contest closes Dec. 1, 1947.

FINLAND NEEDS BOOKS

An appeal for technical books and periodicals for the Teknillinen Korkeakoulu (Technical Institute) of Finland has been received from Arthur E. Morgan, member of the American Friends Service Committee. The Institute's library was bombed during the war and totally destroyed.

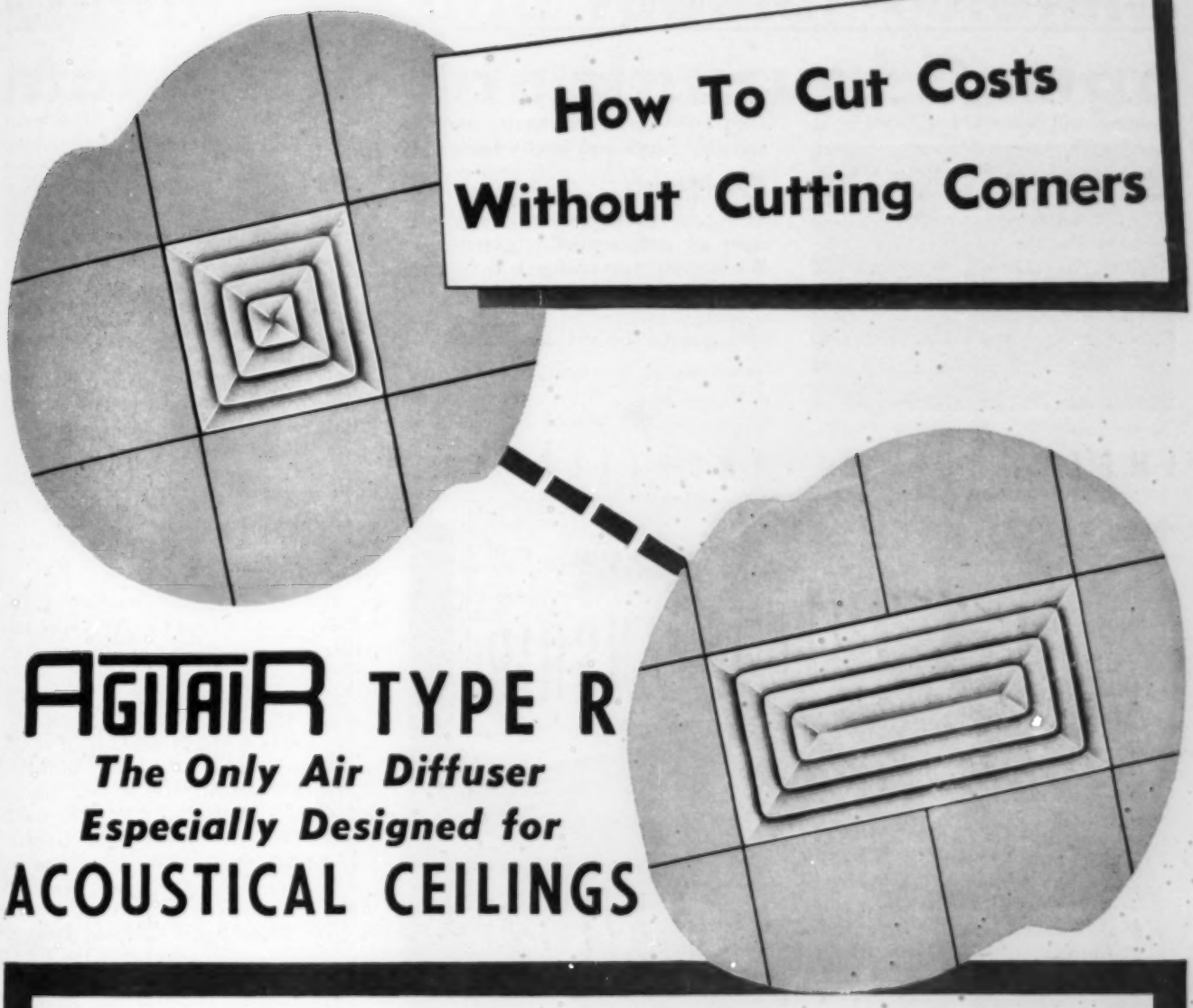
Gifts of such periodicals and books should be marked for the Institute of Technology, Helsinki, and sent to the Legation of Finland, 2144 Wyoming Ave., N.E., Washington, D.C.

AT THE COLLEGES

Two dormitories

First step in the Illinois Institute of Technology's huge development program on Chicago's near south side will be two dormitories for men students.

(*Continued on page 146*)



How To Cut Costs Without Cutting Corners

AGITAIR TYPE R

The Only Air Diffuser Especially Designed for

ACOUSTICAL CEILINGS

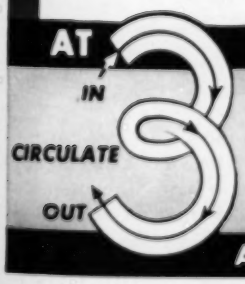
Acoustical Tile, Perforated Steel, or Glass Brick ceilings? Then specify the logical air diffuser—Agitair Type R. It's the only diffuser made in standard sizes to fit acoustical ceilings. Think of the all-around savings with this standardized unit that fits every acoustical ceiling.

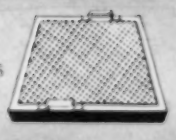
And Agitair Type R gives you 100% control of air distribution — with no drafts, no blank corners, no hot spots, no cold spots. Patented construction permits Agitar Type R to be assembled into numerous patterns which divide the air and discharge it noiselessly in one, two, three or four directions in proportion to the area served.

On that next air diffuser specification — can you afford to overlook the beauty, efficiency, and all-around savings of Agitair Type R?

Write for Complete Data

AT 3 KEY POINTS IN AIR CONDITIONING—AGITAIR SERVES BEST




1 FILTERS

2 DIFFUSERS

3 EXHAUSTERS

DIRECT FIRED HOT GAS GENERATING FURNACES

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construction of which is to proceed immediately. Each of the 4-story walkup buildings will house 109 students in 51 double and seven single rooms.

Exterior of the dormitories will be cream brick to coincide with the new classroom buildings designed for Illinois Tech by Ludwig Mies van der Rohe, head of the college's department of architecture. Skidmore, Owings and Merrill are architects for the housing units in the campus development, which eventually will include 12 dormitories identical with the first two, six apartment buildings, a community building and dining hall, and faculty housing.

Appointments

Newest appointment to the department of architectural engineering at Washington State College is E. Michael Czaja as associate professor. Mr. Czaja, a licensed architect of New Jersey and Ohio, was director of Architecture Studio at Bennington College, and has worked with Antonin Raymond, and Eliel and Eero Saarinen.

The Virginia Polytechnic Institute has announced the following appointments to the faculty of the department of architecture: Heinrich H. Waechter, recently with the Boston Architectural Center and Leland and Larson, Architects, as associate professor of design; Henry H. Wiss, formerly of Clemson College, associate professor of design; Charles S. Worley, formerly assistant head of the Building and Structures Section of the REA, associate professor of design.

At the Rhode Island School of Design recent appointments include: Ernest H. Lichtblau, architect and industrial design, as professor of interior design; and Louis B. Wetmore, Senior Planner for the City of Providence, as lecturer in the field of planning.

ELECTIONS

E. G. Bailey, vice president of The Babcock and Wilcox Co., New York, has been elected president of The American Society of Mechanical Engineers.

Roy A. Shipley, president of the National Fireproofing Corp., Pittsburgh, Pa., has been reelected president of the Structural Clay Products Institute. Reelected with Mr. Shipley were: Joseph A. Brown, Baltimore Brick Co., Baltimore, Md., vice president; W. Gardner Long, New England Brick Co., Boston, treasurer; and J. J. Cermak, Washington, D.C., secretary.

The Philadelphia Chapter, Pennsylvania Society of Architects of the A.I.A., has announced election of the following officers for the year 1947–48: *president*, Howell Lewis Shay; *vice presidents*, John S. Carver and George Daub; *secretary*, F. Spencer Roach; *treasurer*, Lloyd Malkus; *recorder*, Theodore Clattenburg; *directors*, J. Roy Carroll, Jr., George S. Koyl, H. Barrett Pennell, Walter H. Poole, and Harry G. Stewart.

OFFICE NOTES

Offices Opened, Reopened

Harry L. Alper, Architect, has reopened his office for the general practice of architecture at 565 Fifth Ave., New York 17. Mr. Alper specializes in commercial, residential and store work.

Clifford L. Coleman and Melissa M. Coleman have opened an office for the general practice of architecture under the firm name of Coleman & Coleman, Registered Architects, in Landisville, Penn.

Leslie A. Hoffman has resigned as chief engineer of the American Tube and Stamping Plant of The Stanley Works and has organized the firm of Leslie A. Hoffman, Engineering-Consultants, of

(*Continued on page 148*)

IMPLEMENT OF ARCHITECTURE

The skill of Schlage craftsmen is evident in every Schlage lock. Their experienced hands expertly guide precision machinery through exacting Schlage manufacturing processes. This ideal combination of modern machines and skilled craftsmen provides locks that give a long life of dependable operation.

SCHLAGE
LOCK COMPANY
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Cantilevers and Tubular Columns Make Possible Unusual Design

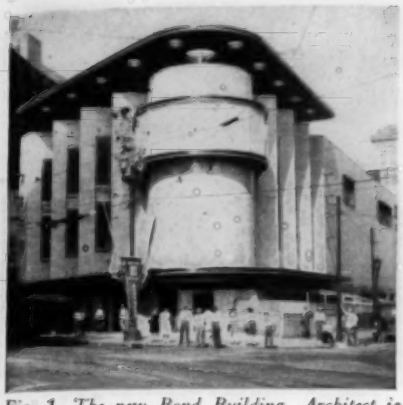


Fig. 1. The new Bond Building. Architect is Walker & Weeks, Cleveland.

By William B. Miller, C. E.
Cleveland, Ohio

THE architectural design of the new Bond Building (Fig. 1), erected on a downtown corner in Cleveland, makes use of cantilevers and some tubular columns. Arc welding was called upon frequently in fabricating the unusual structural forms.

A continuous, saw-tooth ground floor show window plan extends, unobstructed by any exterior columns, around both street sides, over which is a continuous marquee. The marquee and exterior portion of the 3-story building are supported by means of cantilevers from the main interior columns.

Fig. 2 is a sectional sketch of the cantilever construction over the show window. The 18″ x 20″ plates connecting the hanger and the wind bracing (labeled "A" in the sketch) were position welded in the fabricating shop, and the angle hangers were field welded to this plate with ⅜″ fillet welds after the marquee cantilevers were aligned. "Fleetweld 5" electrode was used for all welding on this job.

To give the marquee a slight upward slant (exaggerated in Fig. 2), the main marquee cantilever beams were bent in the shop by flame-cutting part-way through at point "B", bending, then welding the triangular gap, reinforcing the bottom flange with a welded splice plate. The top flange was not cut in order to facilitate fabrication.

As can be seen in Fig. 1, the corner of the building above the marquee line is rounded and extends over the main entrance. Tubular columns are used in this rounded corner to facilitate fabrication of beams framing radially and tangently into the columns. Fig. 3 is a portion of the corner bay on the third floor, showing radial cantilever beams which are shop-fabricated by coping out, bending and welding.

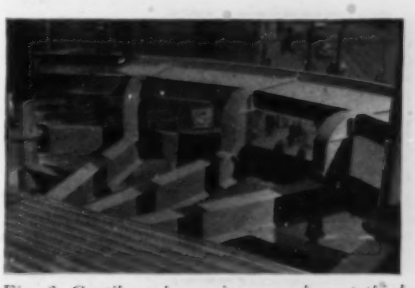


Fig. 3. Cantilever beams in corner bay at third floor level.

Fig. 4. Welding soffit plates of the canopy.

The clean-cut lines of the marquee and the decorative canopy over the top of the building were made possible by arc welded fabrication. The canopy frame is constructed entirely of steel using 10″ I beams of various weights to give a flush surface top and bottom. Top plates ¼″ thick and soffit plates 5/16″ thick were attached to this frame by welding. The soffit plates, erected first, were tightly clipped to the I beam flanges with stud-welded clips, then arc welded to the flange from above (Fig. 4).

After the soffit plates were completely welded, the deck plates were positioned, tack welded and continuously welded to the I beams, the weld metal filling in the ¼″ gap between plates and making a watertight job. The joints between the soffit plates were then welded continuously (Fig. 5). The welds were ground to a smooth flush surface. The open rings in the canopy were shop-fabricated by forming ⅜″ plate into a cylinder and fillet welding it to cut-out top and bottom plates.

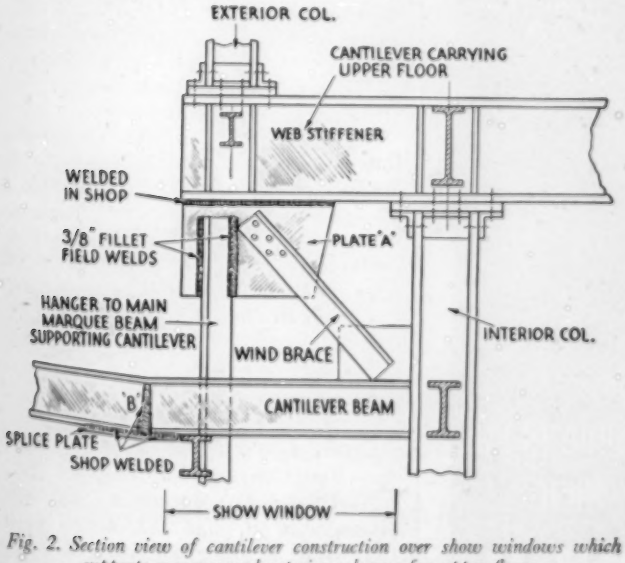


Fig. 2. Section view of cantilever construction over show windows which supports marquee and exterior columns for upper floors.

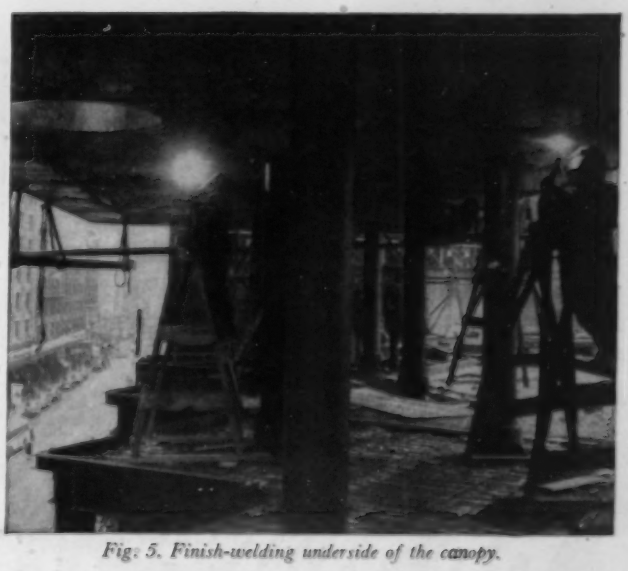


Fig. 5. Finish-welding underside of the canopy.

The above is published by LINCOLN ELECTRIC in the interests of progress. Structural Design Studies are available free to architects and engineers. Write The Lincoln Electric Company, Dept. 265, Cleveland 1, Ohio.

1115 Main St., Bridgeport 3, Conn.

Julian K. Jastremsky, Architect, has opened offices at 19 W. 44th St., New York, N.Y.

Eliot Noyes, Industrial Designer, has opened an office at 438 E. 88th St., New York 28, N.Y. Mr. Noyes, formerly director of the Department of Industrial Design at the Museum of Modern Art, New York, and design director for Norman Bel Geddes and Co., is sharing office space with Marcel Breuer, Architect. He and Mr. Breuer will serve as consultants for each other in their respective fields.

New Addresses

The following new addresses have been announced:

Carl Frederik Brauer, A.I.A., 120 E. 65th St., New York 21, N.Y.

J. R. Davidson, Designer, 548 S. Barrington Ave., Los Angeles 24, Calif.

Frantz & Addkison, Architects (Randolph Frantz, A.I.A., William L. Addkison, A.I.A., and Charles B. McElroy), State and City Office Bldg., Roanoke, Va.

Sanford W. Goin, A.I.A., 634 E. Church St., Gainesville, Fla.

Purchasing Division of the District of Columbia, Room 4026, East Administration Bldg., 300 Indiana Ave., N.W., Washington 1, D.C.

Frederick I. Sather, A.I.A., 9822 N.E. Second Ave., Miami 38, Fla.

Firm Changes

Announcement has been made of the association of William Howard Edie, A.I.A., with the firm of Bamberger and Reid (Sidney Bamberger, Structural Engineer, and John Lyon Reid, A.I.A., Architect,) Address: 417 Market St., San Francisco 5, Calif.

L. A. Ferris and Graham Erskine have announced an association for the practice of architecture and engineering under the firm name of Ferris & Erskine, Architects and Engineers, with offices at 577 LaRue Ave., Reno, Nev.

Ernest R. Hanson, formerly associated with the Halowax Corp. and the Bakelite Corp., has joined the staff of Foster D. Snell, Inc., Consulting Chemists and Engineers, New York, to head up research and development in the field of plastics and rubber.

Frank Grad and Sons, Architects and Engineers, of 187 Market St., Newark 2, N.J., have announced that John Hans Graham, Architect, is now a member of the firm.

H. S. Nixon, Consulting Engineer, has announced the change of his firm's name to H. S. Nixon Engineering Co., with new offices at 306 W. O. W. Bldg., Omaha, Neb.

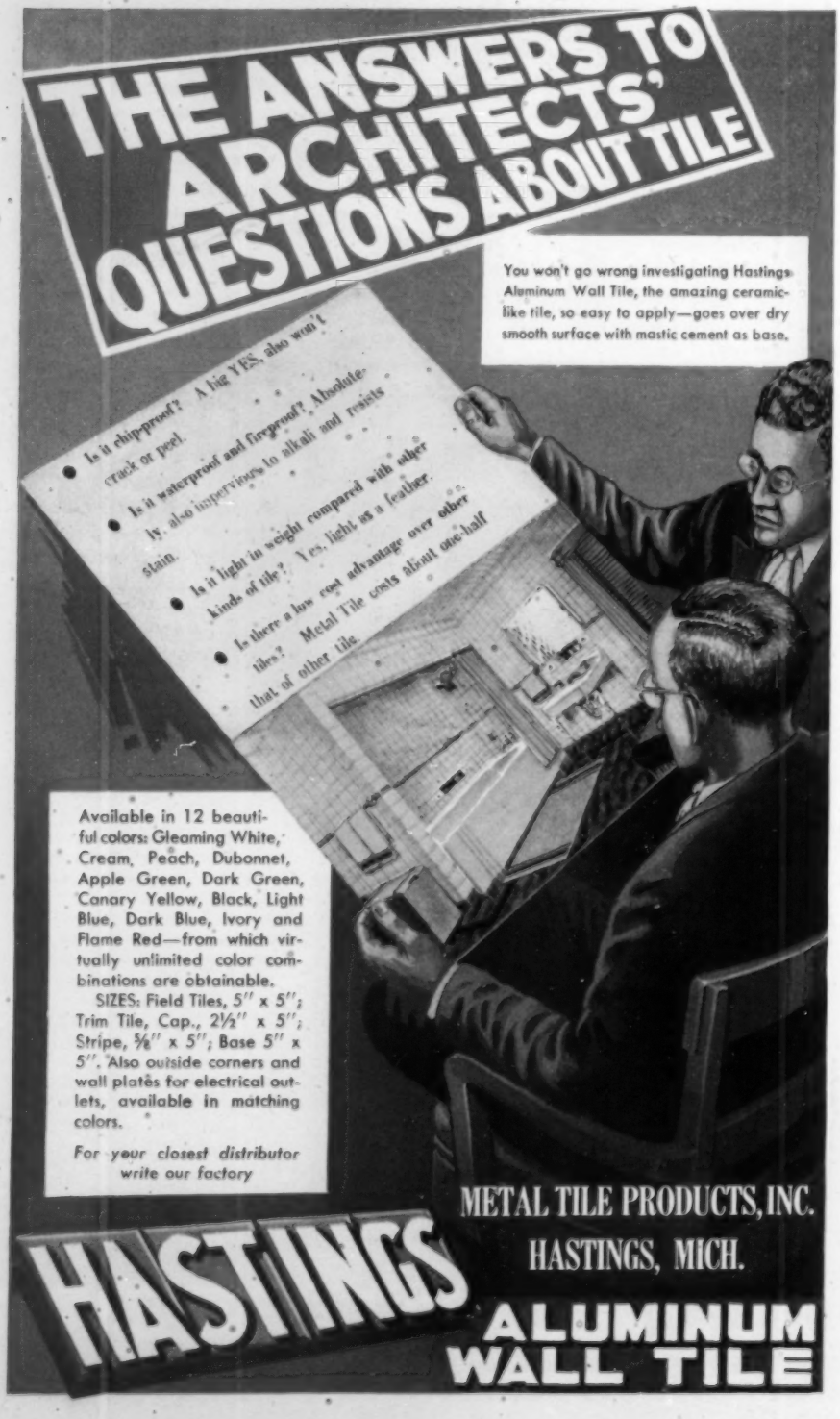
Harold S. Pawlan, Architect, has announced his association with the office of Sidney C. Finck, Architect, Suite 2226, 134 N. LaSalle St., Chicago 2, Ill.

Morris Sanders, Architect, has joined the Formica Insulation Co., Cincinnati, as consultant on plastics, product development and design.

Alfred Shaw, F.A.I.A., Architect, Carl A. Metz, A.S.C.E., Structural Engineer, and John Dolio, A.S.M.E., Mechanical and Electrical Engineer, have announced the formation of a partnership under the firm name of Shaw, Metz & Dolio, with offices at 208 S. LaSalle St., and 80 E. Jackson Blvd., Chicago.

CORRECTION

Credit should have been given to the Arch Roof Construction Company, Inc., engineers and contractors, for the photograph on page 118 of the April 1947 issue, showing the steel rib arch, as they were designers of the structure shown and they supplied the photograph to Bethlehem Steel Company.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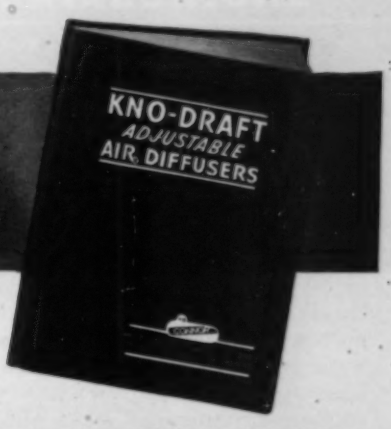

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Illustration from handbook showing industrial application of Kno-Draft Diffusers.

Illustration from handbook showing how Kno-Draft Adjustable Diffusers blend with interior.

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(*Continued from page 130*)

CEMENT ADMIXTURE

Portite is announced as an organic compound in liquid form which, when added in small amounts to cement, reduces the water requirements of the mix by 20 per cent or more, with reduced shrinkage and segregation. Larger amounts reportedly make the concrete waterproof. It is used in mortar to eliminate the need for lime and to produce strong waterproof joints with reduced efflorescence; in cement plaster, finishes and stucco, to provide waterproof non-dusting surfaces. Hopper Products, Inc., 12 East 41st St., New York 17, N. Y.

HEATING

Radiator Valve

Automatic temperature control is provided by a steam radiator valve that is soon to be marketed. The *Heat Timer Valve*, installed in place of the ordinary air valve, has a movable indicator that

Dial on radiator valve marks desired room temperature, and steam cut-off point

can be rotated until it points to the desired room temperature, ranging from 55° to 80°. The valve is said to allow steam to enter the radiator only when the room temperature is below the desired level. It can be installed on any one-pipe steam system. Heat Timer Corp., 160 Fifth Ave., New York, N. Y.

Gas Furnaces

The *Iron Fireman* line of automatic firing equipment has now been expanded to include radiant gas conversion burners, gravity gas furnaces, and forced circulation gas furnaces. Featured is a type of heating element which reportedly becomes highly radiant in absorbing the heat of the gas flame. The burner has horizontal gas ports in a stainless steel head; and is designed to preheat the air before mixture with the gas, for higher combustion efficiencies. Iron Fireman Mfg. Co., 3170 West 106th St., Cleveland 11, Ohio.

Air-Eliminator

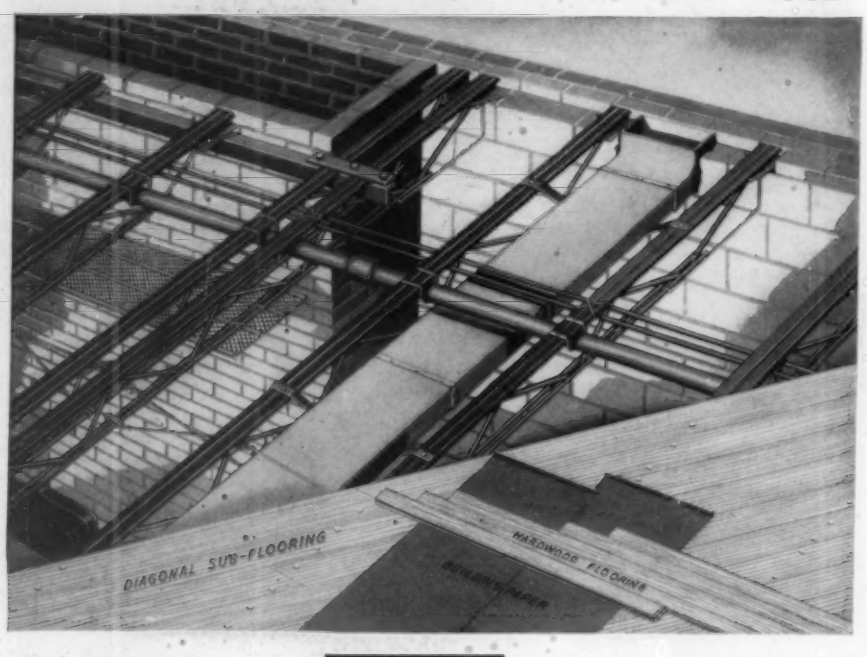
The *B & G Airtrol System* is designed to eliminate the accumulation of air in hot water heating systems and consequent air binding in the system or waterlogging of the expansion tank. It has two basic parts, a boiler fitting and a tank fitting, whose combined function is to trap air in the compression tank and prevent its return to the boiler, piping, and heat distributing units. Bell & Gossett Co., Morton Grove, Ill.

PLYWOOD

The range of plywoods that are now available for store modernization and other decorative work includes oak, birch, maple, elm, walnut and gum; and imported woods, such as mahogany, primavera, zebrawood, avodire, de Oro, and rosewood. U. S. Plywood Corp., 55 W. 44th St., New York 18, N. Y.

(*Continued on page 152*)

STEEL JOISTS AND STUDS
YOU CAN NAIL INTO LIKE WOOD



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(Continued from page 150)

FORM STRIPS

A new method has been developed for forming bevels and decorative grooves on concrete surfaces by means of rubber strips attached to the forms instead of wood strips. The rubber is said to produce a smooth finish, free of blemishes, and can be used many times. The strips will be manufactured in various shapes and sizes for bevels and decorative treatment. They are attached to the form with a waterproof adhesive, and can be removed without chipping the mortar. U. S. Rubber Co., Rockefeller Center, New York, N. Y.

GARAGE DOORS

A custom-built garage door service will supply doors built to specification for any size opening. Face can be either wood, aluminum, or steel, constructed on an extruded aluminum frame with an asphalt board backing for increased rigidity and insulation. Different types of hardware can be furnished. R. L. Taylor, Inc., 12480 Evergreen Rd., Detroit 23, Mich.

Garage doors are built to specification

GLASS DOOR FRAME

A prefabricated metal door frame for use with Herculite all-glass doors comes as a complete factory-packaged unit. It is made of anodized extruded aluminum reinforced with steel channels and tie rods; available in 12 standard patterns and sizes. The assembly includes a checking floor hinge and top pivot, and comes ready to bolt into the rough door opening. Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Penn.

ALUMINUM PANEL

Developed primarily as a material for storefronts and interiors, *Zourite* is an aluminum corrugated panel that comes in standard 20 ft. lengths, complete with edge and angle trim molding, for application (vertically or horizontally) to walls of wood, masonry, or metal. Tongue and groove joints are designed to provide for adjustments in width, and allowance for expansion, contraction, and building settlement. Suggested applications include exterior and interior walls, sign backing, ceilings, canopy soffits, bulkheads, pilaster facing, decorative panels, doors, counter facing, transom areas, and free-standing display screens. The Kawneer Co., Niles, Mich.

MODELS

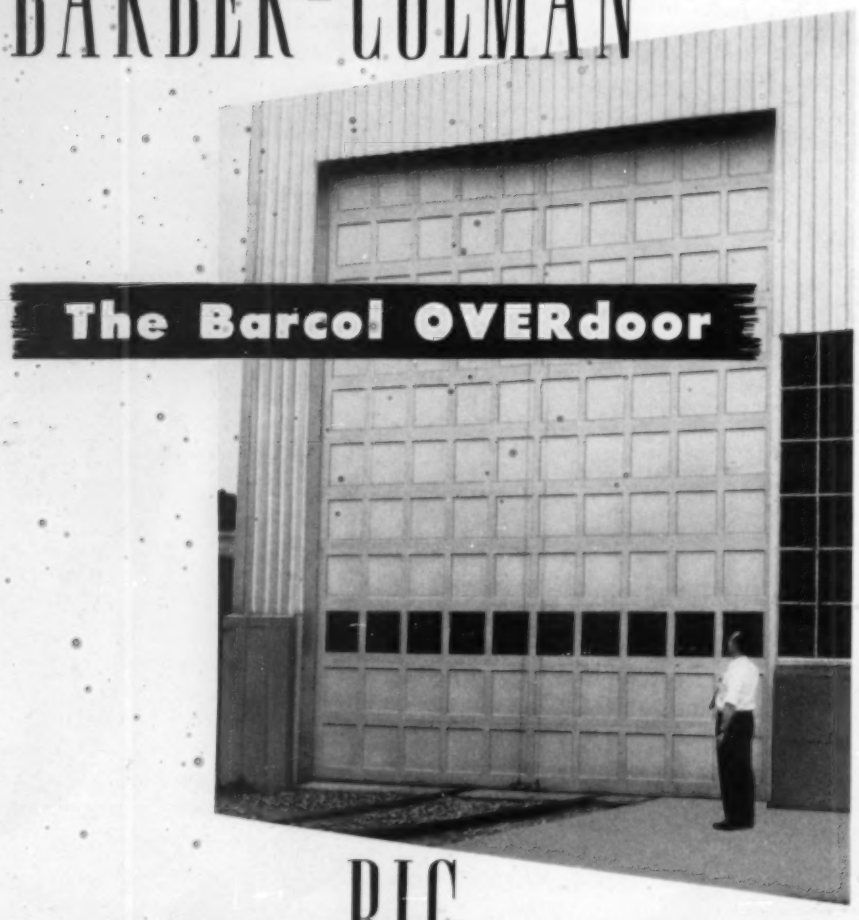
A model building service has been announced, specializing in architectural scale models, floor layouts, industrial dioramas, and models of product design. Architectural Model Builders, Inc., Frankfort, Ill.

ALUMINUM WINDOW

The *NuEra aluminum window* is double hung, with narrow aluminum mullions in a large glass area. Several design

(Continued on page 154)

BARBER-COLMAN



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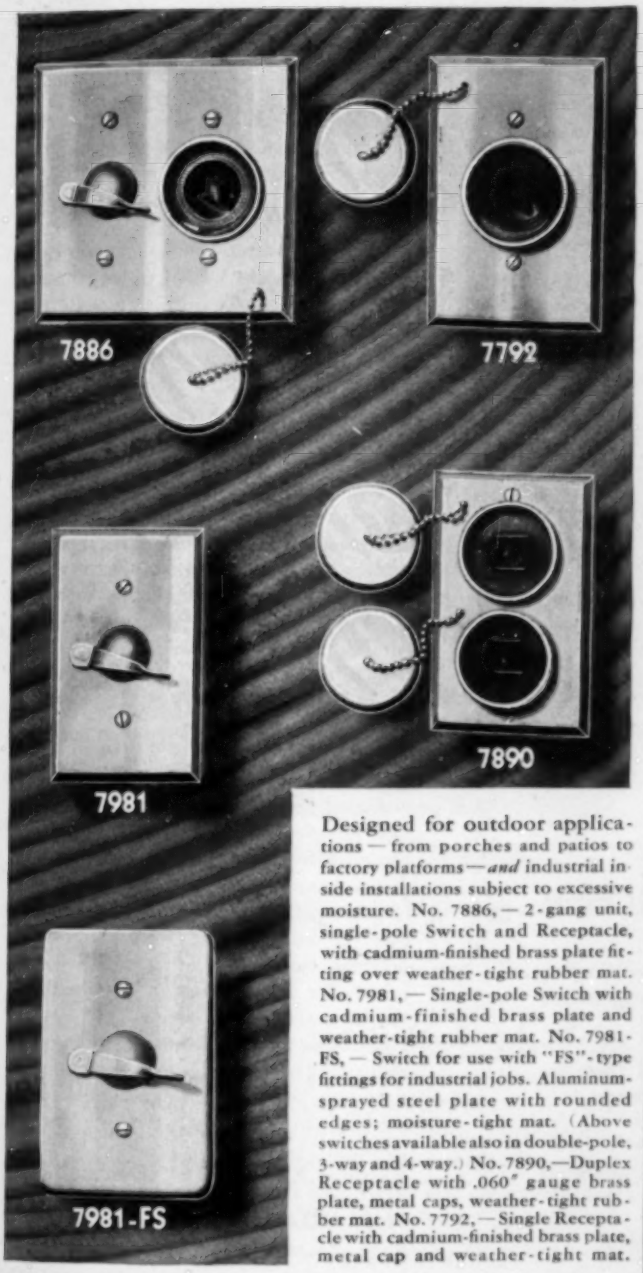

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(*Continued from page 152*)

features are said to be unique in window construction. The aluminum movable jamb member can be advanced or retracted by gears operated by a handle and push-button lock. When the lock is in position, the sash slides up and down by fingertip pressure. In another position, the sash will swing entirely free of the frame, supported by a cord, so that it can be reversed for cleaning. Made in standard sizes, the window is supplied completely assembled, with plaster grounds and shade brackets, trim, soffit, and hardware. An integral lintel eliminates need for separate support, and no flashing is required overhead or under sill. NuEra Window Co., Bedford, Ohio.

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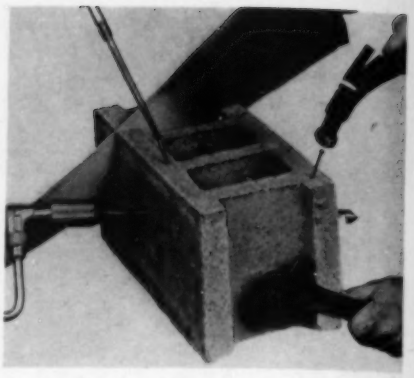

Special block can be worked like wood

mastics. In size and appearance, *Mul-Kra Wonder Block* resembles regular concrete block, but is said to have much the same working properties as wood since it can be sawed, sanded, drilled, screwed, and nailed. Carl Kranz, c/o Marketing Associates, 904 Lapeer St., Saginaw, Mich.

SOIL STABILIZER

The *Vibroflotation machine* uses powerful vibrations and jets of water to pack loose sand or soil into a mass solid enough to support building foundations, water retaining dams, and heavy airport runways, according to a recent announcement by SKF Industries, Inc. The machine, weighing 2500 lb. and powered by a special G-E motor, can be attached to standard types of construction cranes. Originally built and tested in Europe, the first vibroflotation machine in the U. S. was recently constructed by the Baldwin Locomotive Works, Eddystone, Penn., developed and tested by Parsons, Brinckerhoff, Hogan & Macdonald, consulting engineers, N. Y., and Merritt, Chapman & Scott, general contractors.

PHOTO PROCESS

Kodagraph Autopositive Paper, is a new silver-sensitized type of paper for reproducing drawings on blueprint or direct-process equipment in normal room light, yielding a high-contrast positive copy direct from a positive original. Such copies are intended primarily for use as printing intermediates or "masters," and also as file copies. Use of this paper is said to eliminate the redrafting of worn, discolored, or opaque drawings, since it produces fine detail and high contrast. Either "print through" or "reflex" printing is used. Eastman Kodak Co., Rochester, N. Y.

THERMOMETER

The *Duo-Temp thermometer* is mounted in a clock-type housing that registers indoor and outdoor temperatures. Design is said to eliminate common error in outside temperature readings. Jas. P. Marsh Corp., 2073 Southport Ave., Chicago.

(*Continued on page 156*)

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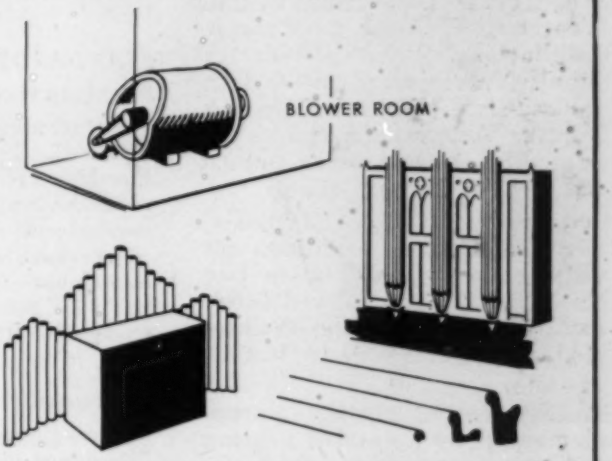

● Many clients who could very logically be expected to spend thousands of dollars for a fine pipe organ will find music by the Wurlitzer Organ adequately meets their every requirement. Thus, with a Wurlitzer Organ installation, the saving in money will enable you to plan finer, and in many cases larger, better equipped buildings. The saving in cost of installation, maintenance and space conserved for other purposes, make the Wurlitzer Organ doubly desirable.

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Modernization Progress — a Continued Story

Administration Building (left) and Shrine, Our Lady of Victory Homes of Charity, Lackawanna, New York.

A seven-year program to obtain maximum comfort and low cost heating operation with Webster Moderator Control is a feature of the successful management of the heating plant at Our Lady of Victory Homes of Charity.

During this period, Webster Moderator Control was installed in six buildings in this group.

In each of these "Controlled-by-the-Weather" Webster Moderator installations, Webster Radiator Supply Valves were fitted with expertly-sized Webster Metering Orifices. Automatic heating was assured by an Outdoor Thermostat and Webster Central Controls.

Founded by the late Father Baker, this great Catholic institution cut heating costs $3,000.00 in one heating season and enjoyed better heating service with the Webster Moderator System of Steam Heating.

The long-range program for effective heating control is supplemented by a careful heating maintenance program which includes prompt replacement of inoperative trap interiors.

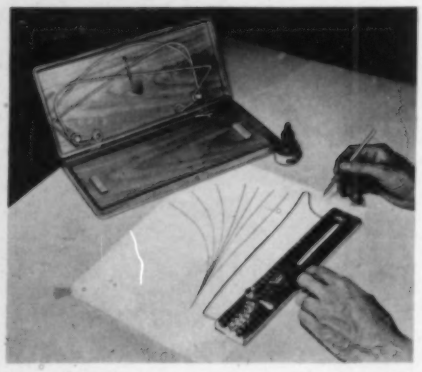
L. A. Cherry, of the Industrial Planning Company, Buffalo, has acted as Consulting Engineer in the modernization of Our Lady of Victory Homes. George E. Schank, Buffalo, served as heating contractor for many of these Webster Moderator installations.

We are ready to work with you as we have with this Webster Customer.

WARREN WEBSTER & CO., Camden, N. J.
Representatives in principal U. S. Cities : : Est. 1888
In Canada: Darling Brothers, Limited, Montreal

Webster
HEATING • SYSTEMS

(Continued from page 154)



Adjustable guides for drawing curves

FOR DRAWING CURVES

A new drawing aid, called *Infinarc*, provides a guide for curved lines by means of wire forms, shapes of which are altered by moving either or both of two adjustment screws along slots in the base. The device consists of the 12-in. base and four preformed wire curves; which are interchangeable by snapping loops over the ends of the adjustment screws. Cook Specialty Co., Green Lane, Penn.

STANDARDS

Plumbing Fixtures

Just released is Commercial Standard CS2C–47, "Staple Vitreous China Plumbing Fixtures (Fourth Edition)," revised to bring it into line with latest developments in faucet hole spacing, water closet and urinal design; and colored ware; and the addition of flat-rim sinks and laundry trays. Superintendent of Documents, Washington, D. C. *10 cents.*

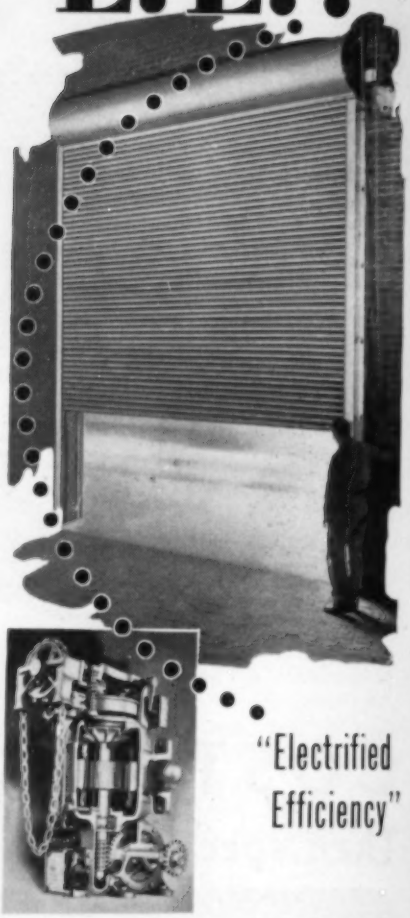
Hardwood Plywood

A new Commercial Standard, CS35-47, "Hardwood Plywood (Third Edition)," provides minimum specifications for four standard types of hardwood plywood in four standard grades, covering tests, densities, thicknesses, lengths and widths, tolerances, workmanship, packing, inspection, grade marking and certification, ordering procedure, nomenclature, and definitions. Effective date for new production is announced as Feb. 20, 1947. Superintendent of Documents, Washington, D. C. *10 cents.*

Adhesives

The American Society for Testing Materials has issued its first compilation of physical tests and definitions relating to adhesives, including a test for evaluating strength properties of adhesives in plywood construction: "A.S.T.M. Standards on Adhesives." American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penn. *$1.25*

Do Your Doors Offer E. E.?



"Electrified Efficiency"

With the "electrified efficiency" of Motor Operated Kinnear Rolling Doors, you can speed up deliveries, keep door traffic moving faster, save time and labor, cut heating and air-conditioning costs by making it *easy* to close doors *promptly*. Push-button controls for each door can be placed at any point, with additional remote control switches if needed. In addition, these rugged, all-steel, upward-acting doors save *usable* floor and wall space . . . coil out of the way overhead, safe from wind or vehicles . . . add to fire and theft protection . . . stand up longer, with less care, under hardest use. Built to fit any opening in old or new buildings. Write:

The KINNEAR MANUFACTURING CO.
FACTORIES
1860-80 Fields Avenue • Columbus 16, Ohio
1742 Yosemite Avenue • San Francisco 24, Calif.
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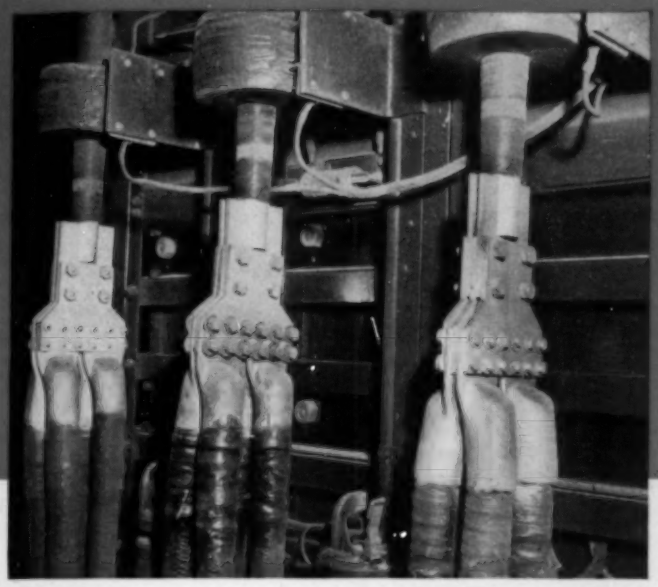
KINNEAR
ROLLING DOORS

Indoors... Outdoors... Today and 30 Years Ago...
ALUMINUM HAS PAID OFF ON MANY INSULATED WIRE AND CABLE INSTALLATIONS



INSTALLED IN 1916 and still operating satisfactorily today. 450 Volt D.C. line carrying 1390 amperes per cable in a Rotary Converter Station. The four 1,590,000 CM aluminum cables insulated with varnished cambric involved 1700 connections to the apparatus.

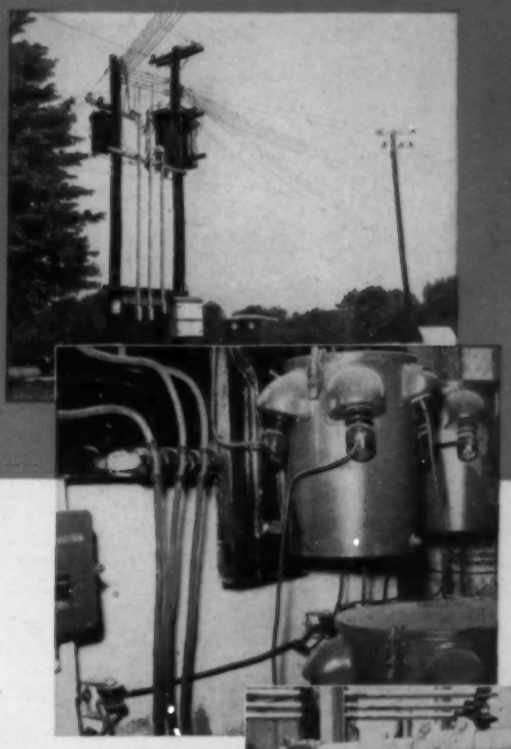
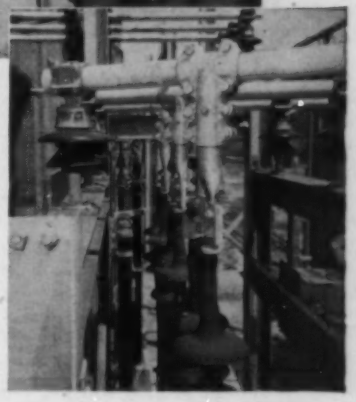


FIGURE IT IN ALUMINUM



Hazard insulated aluminum conductors are being used to advantage for many building wire installations as well as underground, aerial and service entrance cable requirements. Cost savings up to 40% . . . weight savings up to 60% . . . easier handling and pulling — results like these make it worth your while to investigate the use of aluminum conductors when figuring a job.

Hazard Performite Type RH Aluminum Building Wire is carried in factory stock and by many wholesalers — for immediate shipment in sizes 6Awg to 500,000 CM. Other sizes and cable designs can be fabricated in as little as 4 to 6 weeks. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

(Top) **LIGHTING INSTALLATION.** Performite double braided cable with aluminum conductors used for permanent outdoor lighting wiring at a new sports arena in Pennsylvania. *(Center)* **POWER FEEDER CABLES** with aluminum conductors, Performite insulation, Hazaprene jacket, 5KV, used in a state centennial exhibition. *(Bottom)* **HIGH VOLTAGE POWER SUPPLY.** 15KV cables with 800,000 CM aluminum conductors terminated outdoors with welded aluminum lugs bolted to aluminum bus in large southern industrial plant.

Write for Bulletin H-407-AL which contains tables, calculating data and details of simple splicing and terminating methods.

6110

HAZARD

insulated wires and cables for every electrical use

VAPOR CONDENSATION ON WINDOWS May Help Cupid . . .

but

"In-wall" Condensation Invites Trouble

"Steam" on the window may be a boon to puppy love, but when the same vapor condenses within walls it can lead to serious trouble. Unchecked condensation may rob insulation of its efficiency, hasten structure rot, cause paint peeling and wall stains. A sure way to prevent "in-wall" moisture damage is with a separate vapor barrier. Architects the country over specify the standard — Bird Neponset Black Vapor Barrier. Applied on the warm side of insulation, Bird Neponset Black repels vapor, keeps insulation at peak efficiency, stops other condensation evils. Costs only about $20 to protect a $10,000 building. Consult Sweet's Architectural file, 9b-2. For sample, write Bird & Son, inc., 179 Wash. St., East Walpole, Mass.

VAPOR BARRIER
BIRD
OUTSIDE OF WALL
COLD SIDE
INSIDE OF WALL
WARM SIDE
Specifications: roll width: 36"; Sq. feet: 500; approximate wt.: 50 lbs. Asphalt Saturated. Coated both sides with glossy asphalt surface. Meets Federal Specifications UU-P-536 Grade B.
SHEATHING
STUD

BIRD NEPONSET BLACK VAPOR BARRIER

BIRD & SON, inc., E. WALPOLE, MASS.
CHICAGO NEW YORK SHREVEPORT

(Continued from page 136)

able metal structures. Suggestions are given on type of flooring, drainage, lighting, brackets and end treatment. 22 pp., illus. Armco Drainage and Metal Products, Inc., Middletown, Ohio.*

VALVES AND FITTINGS

Stainless Steel Valves and Fittings (Catalog 47). Product listing of valves and fittings of stainless steel and other corrosion-resistant alloys for manufacture and processing of chemicals, dyestuffs, food and beverages, oil refinery products, pharmaceuticals, plastics, pulp and paper, soap, and textiles. 54 pp. illus. Alloy Steel Products Co., Inc., Linden, N. J.

WOOD

Wolmanized Preservative-Treated Lumber; Minalith Fire-Retardant Treated Lumber. Folder describing characteristics of lumber treated for protection against decay and termites, and against fire; method of treatment; proper construction usage; standard specifications. 4 pp., illus. American Lumber & Treating Co., 332 S. Michigan Ave., Chicago 4, Ill.*

WROUGHT IRON

The ABC's of Wrought Iron. Nontechnical description of metallurgical characteristics of wrought iron; how made, bent, welded, and threaded. Also, a review of services in various industrial fields. 18 pp., illus. A. M. Byers Co., Pittsburgh, Penn.

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

Charles E. Boettcher, Architect, 2216 15th Ave., Rockford, Ill.

David R. Braden, Student, Deep Eddy Apt. 301-B, Austin, Tex.

Coleman and Coleman, Architects, P. O. Box 212, Landisville, Penn.

Frank Grad & Sons, Architects and Engineers, 1633 Connecticut Ave., Washington, D. C.

Leslie A. Hoffman, Engineering-Consultants, 1115 Main St., Bridgeport 3, Conn.

Wesley Meyan; Head, Rubber & Metal Products Group; Industrial Division, ESS; General HQ, Supreme Commander for Allied Powers; APO 500, c/o PM, San Francisco, Calif.

Mueller, Hair & Hetterich, Architects and Engineers, Hamilton, Ohio.

Edward C. Sutton, Draftsman, 96 Shudell Ave., Toronto, Canada.

The
RESTORATION
of
COLONIAL
WILLIAMSBURG

A Reprint
of the December, 1935
Issue of
ARCHITECTURAL RECORD

104 pages, bound in cloth
$2.00 per copy

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The Colonial Williamsburg Number of ARCHITECTURAL RECORD — issue of December 1935 — was sold out soon after publication but the entire editorial contents have been reprinted and bound in permanent book form with blue cloth covers.

Many thousands of these Williamsburg reprints have been sold but the demand continues unabated.

. . . . . .

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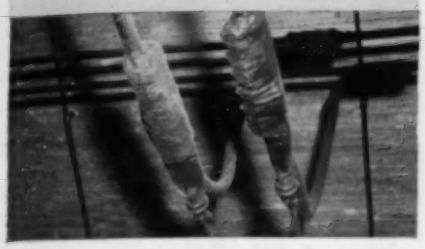
Enclosed is $.....for which send..... copies of your reprint, *The Restoration of Colonial Williamsburg*, bound in cloth, at $2.00 per copy. *(Add 2% Sales Tax for New York City deliveries.)*

Name.....

Address.....

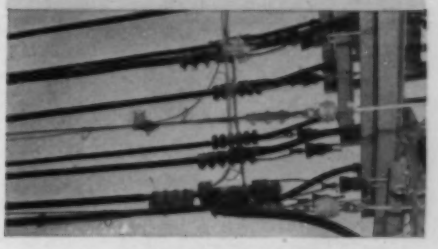
City and State.....A.R. 11-47

INSTALLED IN 1905, this 250-volt D.C. feeder is giving good service. Conductors are 1,590,000 c.m. aluminum T.B.W.P. cables.



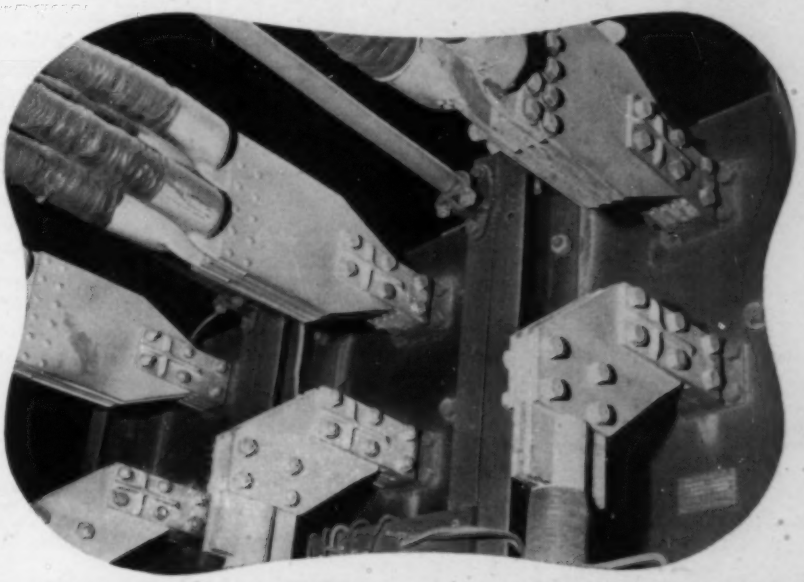
BOLTED DEAD-ENDS on 1,590,000 c.m. aluminum T.B.W.P. cable (Bottom conductors) installed in 1913 in a machine shop for 250-volt feeder.

YARD LINE installed in 1915. Bolted run and soldered tap, aluminum T connectors shown alongside parallel groove clamps installed for later temporary taps.

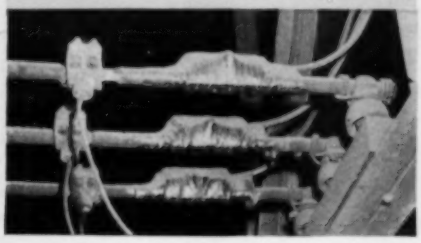


1,590,000 C.M. aluminum T.B.W.P. cable 2200-volt feeder along river. Original aluminum T connectors, bolted run and soldered tap, installed in 1915.

450-VOLT D.C. Line carrying 1390 amperes per cable in a Rotary Converter Station. Four 1,590,000 c.m. aluminum T.B.W.P. cable connections to switchboard using soldered copper lugs. 1700 lugs installed in 1916. Less than 5% of lugs have been resoldered.



220-VOLT 3-phase A.C. Feeders in use since 1915 in a carbon plant. Original aluminum T connectors from 795,000 c.m. aluminum T.B.W.P. cable to No. 8 copper tap. Parallel groove tap under tape made at later date.

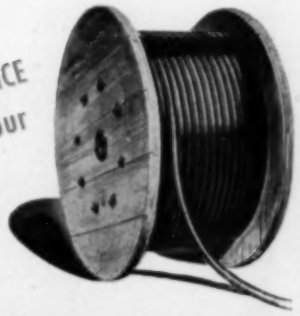


Proof of Performance!

Typical Alcoa E. C.* Aluminum Conductors on the job for more than 30 years *and still in service*

No Problems *of conductivity*
No Problems *of joints and terminals*
No Problems *of conduit layouts*
No Problems *of availability*

The BIG DIFFERENCE is in your COSTS



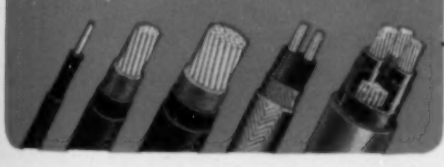
Alcoa E. C. Aluminum, the "conductor of the present and future", has a *past* too! The six installations shown here, all in daily service for more than three decades, are long-standing proof that you can *count on* aluminum!

What's your next construction or modernization job? *Figure it in aluminum*—for efficient, trouble-free service, for lower first cost, and low maintenance costs.

Alcoa makes light, dependable, conductive E. C. Aluminum available to wire and cable manufacturers who insulate it and sell it under their own trademarks. Ask your cable supplier about it, or write for more information to ALUMINUM COMPANY OF AMERICA, 1441 Gulf Building, Pittsburgh 19, Pa.

* E.C.: Electrical Conductor Aluminum

Insulated and sold by leading wire manufacturers



ALCOA EC ALUMINUM

FOR ELECTRIC WIRE AND CABLE